

ALAMER, KHULOD SALEH, Ph.D. An Examination of Early Childhood Teachers' Experiences and Perceptions Regarding Evidence Based Practices Used to Improve Functional Communication Skills of Young Children with Autism Spectrum Disorder. (2020)

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The purpose of this mixed methods study was to examine early childhood education (ECE) teachers' perceptions and experiences using 13 evidence-based practices (EBPs) deemed appropriate by the research literature for improving the functional communication skills of young children with Autism Spectrum Disorder (ASD) in inclusive classroom settings. This study used the constructivist theory of learning to better understand the research to practice gap between these 13 EBPs and what teachers are actually doing in their inclusive ECE classrooms to improve the outcomes of children with ASD. The participants were 65 licensed ECE teachers with experience working with young children with ASD in inclusive classrooms across the state of North Carolina. The study consisted of two phases. In Phase I, quantitative data were collected using an online survey from all participants. In Phase II, qualitative data were collected from a subset of six participants thorough interviews. Descriptive statistics and correlation analyses were used to examine quantitative data while a deductive thematic approach was used to analyze qualitative data. The results revealed a strong relationship between teachers' personal beliefs about the effectiveness of EBPs and their knowledge. The study also confirmed that teachers generally held positive perspectives about EBPs and felt that all 13 EBPs could potentially be effective, but only if adequate training, resources, and supports are

provided. Recommendations for future research and practice are provided based on study findings.

AN EXAMINATION OF EARLY CHILDHOOD TEACHERS' EXPERIENCES AND  
PERCEPTIONS REGARDING EVIDENCE BASED PRACTICES USED TO  
IMPROVE FUNCTIONAL COMMUNICATION SKILLS OF  
YOUNG CHILDREN WITH AUTISM  
SPECTRUM DISORDER

by

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## **CHAPTER I**

### **INTRODUCTION**

Lawmakers, researchers, and practitioners agree that the provision of high-quality early education is beneficial for all children. Experts also agree that a high-quality early childhood education (ECE) program is especially essential for improving the learning, communication, and social skills of young children with disabilities, particularly young children with autism spectrum disorder (ASD) (Barbarese, Katusic, & Voigt, 2006; Dawson et al., 2010; Estes et al., 2015; National Institute of Child Health and Human Development [NICHD], 2014; Pickett, Pullara, O'Grady, & Gordon, 2009; Yell, 2012). Furthermore, research shows that when teachers select evidence-based practices (EBPs) and implement them correctly when working with children on critical skills, child outcomes improve (Cook, Smith, & Tankersley, 2012; Slavin, 2008). Every Student Succeeds Act (ESSA, 2015) refers to these practices as activities, strategies, and interventions that demonstrate a statistically significant effect on improving the outcomes of children (ESSA, 2015).

Increasingly more children with ASD are receiving educational and developmental services alongside typically developing peers in inclusive ECE classrooms (Hansen, Blakely, Dolata, Raulston, & Machalicek, 2014). The Individuals with Disabilities Education Act (IDEA, 2004) states that children with disabilities, including preschoolers, have the right to receive their education alongside their typically

developing peers in the least restrictive environment (LRE) (U.S. Department of Education, Health and Human Services 2015), a practice known as inclusion. Approximately 10% of all preschoolers are diagnosed with a disability, and nearly half of the preschool-age children with disabilities attend inclusive ECE programs (U.S. Department of Education, National Center for Education Statistics, 2012). However, research suggests that children with ASD may not benefit from inclusive education settings without adequate planning and systematic instruction using effective EBPs (Bellini & Akullian, 2007; Blair, Umbreit, Dunlap, & Jung, 2007; L. K. Koegel, Kuriakose, Singh, & Koegel, 2012; Williams White, Keonig, & Scahill, 2007). Thus, it is critical that general ECE teachers know how to select, plan, and accurately implement EBPs in the inclusive classroom settings to ensure children with ASD have the best chance at improved outcomes.

Administering effective interventions as early as possible in a child's life is especially critical because the brain's ability to form new connections is at its highest capacity to develop and redesign itself based on the child's experiences (i.e., interventions) during these early years (Gordon, 2009). However, accurate and consistent implementation of EBPs for preschoolers can be challenging. Previous studies on the implementation of EBPs revealed a host of complex and interrelated problems, such as issues related to serving children with ASD in inclusive settings, selecting appropriate EBPs, teacher attitude, skill, time, and administrative support (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Nelson, Leffler, & Hansen, 2009; Rakap, Balikci, & Kalkan, 2018; Tseng, 2012). This study examines these issues, with a specific focus on ECE

teachers' use of EBPs to improve communication skills among children with ASD who were between the ages of 3-5.

The purpose of this study is to examine ECE teachers' perceptions and experiences using EBPs to improve the functional communication skills of young children in inclusive settings. Research in this area has mainly focused on determining which interventions are most effective for improving communication skills among children with disabilities, including children with ASD, as well as examining teachers' perspectives regarding the use of EBPs in inclusive classrooms. Prior to this study, questions regarding teachers' perspectives on the effectiveness of using EBPs to improve the outcomes of preschool children with ASD in inclusive ECE classroom settings have been largely unanswered. This study seeks to answer the following research questions:

1. What are the relationships among ECE teachers' beliefs, knowledge and training on EBPs?
2. What EBPs do ECE teachers perceive to be most effective for addressing functional communication needs of young children with ASD in inclusive classrooms?
3. What challenges do ECE teachers experience when implementing EBPs with young children with ASD in inclusive classrooms?
4. What supports do ECE teachers receive while implementing EBPs?

### **Theoretical Framework**

The design of this research study is influenced by John Dewey, who is often cited as the first theorist to pose the idea of a constructivist approach to learning (Henson,

2015). He asserted that learning is an active problem-solving process by which learners (in this case, educators) construct new knowledge and understanding from their prior knowledge, experiences, and interactions with their surroundings (Henson, 2015).

Constructivism is based on the premise that “learning occurs only when the learner ties newly acquired information to previously gained understanding” (Henson, 2015, p. 4).

In response to Dewey’s theory, Piaget (1987) agreed that learners construct knowledge and make meaning of their environment. He emphasized the importance of natural maturation and stages of development (Piaget, 1987; Seltzer, 1977). However, Piaget theorized that learning is based on how individuals perceive their experiences. He believed that learning is a cognitive process of incorporating new experiences into the old ones, which then causes the learner to rethink old misunderstandings, resulting in the development of new perspectives and ways of thinking about the world. The principles of social constructivism build on constructivism but hold that learning happens as a result of an individual’s interactions with other people (Vygotsky, 1978). Vygotsky, one of the founding theorists of social constructivism, agreed with Piaget’s idea that individuals learn from their perceptions of their own experiences, but added that there is also a social component to learning—that learning is a collaborative process. He maintained that learning is socially constructed through shared experiences and discussions with others, placing more emphasis on how culture, social factors, and inner language (self-talk and reflection) affect and shape one’s cognitive development (Vygotsky, 1978).

Situated within social constructivist theory is transformative learning theory, first introduced by Jack Mezirow in 1978 (Kitchenham, 2008; Mezirow, 1991). Mezirow’s

theory focuses on two types of learning: instrumental and communicative. Instrumental learning refers to the learning that occurs through task-oriented problem solving and understanding cause and effect relationships. Communicative learning occurs when individuals—educators in this study—share their feelings, needs, and desires. As transformative theory asserts, the challenge of exploring and evaluating their own practices and underlying beliefs could potentially lead to positive changes and improvements in ECE teachers' future practices. Mezirow (2000) asserted that learning experiences are “internalized by-products of publicly shared discourse” (p. 3) and that an individual's interpretation of a learning experience allows one to gain an understanding and awareness of one's current habits of mind (behaviors, mindsets, and beliefs) as well as one's resulting points of view. When this self-awareness subsequently causes a self-critique of “assumptions and premises, an assessment of alternative views, a decision to negate an old perspective or view in favor of a new one, or to make a synthesis of old and new, resulting in more justified beliefs to guide action” a transformation in beliefs and/or practices occurs (Gravett, 2004, p. 259).

The aim for applying constructivist theories of learning to this study was to facilitate ECE teacher's engagement in exploring and self-evaluating their practices, including their mindsets, beliefs, and points of view. More specifically, the goal was that as the teachers completed the survey, and for a subset of participants, also discussed their experiences and perspectives in one-to-one interviews, they would engage in this type of constructive, transformative, self-reflection about the EBPs they used in their classrooms--why they used them, which ones worked, what barriers they encountered. Potentially,



this self-reflection process could lead participants to critique old assumptions, abandon old perspectives or perceptions in favor of new ones, and/or make a synthesis of old and new ones resulting in a transformation.

### **Definition of Terms**

A brief definition of key terms that are important to understand within the context of this study is presented in this section.

#### **Autism Spectrum Disorder (ASD)**

ASD refers to a group of complex neurodevelopmental disorders characterized by a broad spectrum of deficits in social communication and interaction and repetitive and characteristic patterns of behavior (American Psychiatric Association [APA], 2013). Symptoms of the disorder generally begin to show up before age three and last throughout the child's life, although they may improve over time. Common early symptoms include a lack of eye contact, response to own name when spoken to, social interactions, and verbal and nonverbal communication. Other characteristics of ASD include peculiar reactions to sensory stimuli and restricted and repetitive behaviors. Some children may develop symptoms within the first few months of life, while other children show normal development up until about the age of two. For example, a young child with ASD may stop gaining new skills or lose skills he or she once had. Many children with ASD express single words by the age of one to two years, but then stop using them (Coleman & Gillberg, 2012).

**Early Childhood Education (ECE) Teacher**

For this study, ECE teacher is defined as an early childhood educator with three or more years of experience who holds a valid early childhood educator license issued in the state of North Carolina and who has worked with one or more children with ASD within the last three years in inclusive preschool settings. In North Carolina, a Birth-Kindergarten (BK) degree and license certifies ECE teachers to work with young children with and without disabilities and their families. Preservice ECE teachers must complete the BK program coursework from an accredited college or university and a student teaching/ internship to qualify for an initial three-year North Carolina Educator's Standard Professional I license issued by the North Carolina State Board of Education. The North Carolina Birth-through-Kindergarten Standard Professional II license is issued to teachers with three or more years of experience who have completed the three-year induction, or beginning teacher, or post-baccalaureate program (North Carolina Division of Child Development and Early Education, 2015).

**Evidence-Based Practices (EBPs)**

The U.S. Department of Education's Research and Training Center on Early Childhood Development (CED) defines EBPs as practices that are "informed by research, in which the characteristics and consequences of environmental variables are empirically established and the relationship directly informs what a practitioner can do to produce the desired outcome" (Odom et al., 2005, p. 142).

**Functional Communication Skills**

Functional communication skills refer to one's ability to communicate basic feelings, wants, and needs effectively and verbally. Hereafter, functional communication delays refers to impairments in speech and language that hinder one's ability to express those basic feelings, wants, and needs verbally (Paul, 2008).

**Inclusive Classroom**

An inclusive classroom is a general education classroom in which children with and without disabilities learn together (Odom et al., 2004). It is essentially the opposite of the special education classroom, where children with disabilities learn only among other children with disabilities. In their joint mission statement, the Division for Early Childhood (DEC) of the Council for Exceptional Children and the National Association for the Education of Young Children (NAEYC) state that it is the right of every infant and young child to participate in inclusive settings in early childhood to develop a sense of belonging and positive social relationships, and to be able to learn and develop to their fullest potential (DEC & NAEYC, 2009). The defining features of high-quality early childhood inclusion programs and services include access, participation, and supports (DEC & NAEYC, 2009).

In an inclusive classroom, a teacher with dual certification (or a general and special education teacher as co-teachers) provides instruction to a diverse group of students, including those with and without special needs (Friend, Cook, Hurley-Chamberlain, & Shamberger, 2010). In North Carolina, all public preschool and many private preschool programs require ECE teachers to hold a state-issued BK teacher

license, which certifies them to teach children with and without disabilities in general education settings.

### **Typical Preschool Setting**

For this study, a typical preschool setting refers to the inclusive classroom environment in which EBPs are implemented. If the teacher implements an EBP with a child with ASD in a room or area where other preschool children with or without disabilities are also present and under the supervision of that teacher, it is considered a typical preschool setting. The justification for this definition is that in typical preschool classroom settings, ECE teachers are often responsible for implementing interventions for one or more children while also managing others.

### **Research Problem**

Since the passage of IDEA (2004), schools, including ECE programs, have been required to hire highly qualified teachers who can select and use EBPs to support the development and learning of children. In response to the mandate concerning the use of EBPs in classrooms, many instructional practices and approaches have been identified or developed for practitioners to use (Cook & Cook, 2013). Several different organizations and research groups have conducted extensive reviews of the literature to identify EBPs for children and adults with ASDs. For example, the National Autism Center (NAC) released the National Standards Report (NAC, 2009), which provided information on evidence-based interventions along with specific guidelines for choosing appropriate interventions. More recent studies have specifically determined which intervention

models, or components of those of models, result in the most favorable outcomes for young children with ASD (Steinbrenner et al., 2020; Wong et al., 2014).

Anderson, Smith, and Wilczynski (2018) point out, most teachers, in both special and general education, have continued to report feeling ill-prepared to address the diverse needs of students with ASD in their classrooms. The authors attribute this in part to a lack of clarity regarding which interventions are practical for classroom implementation. Farley, Brock, and Winterbottom (2018) explain that many early childhood educators also struggle with identifying if practices are evidence-based (Farley et al., 2018).

Although a number of studies (e.g., Anderson, Martin, & Haynes, 2017; Steinbrenner et al., 2020; Wong et al., 2014) provide a clarifying list of EBPs identified effective that could aid practitioners in selecting age-appropriate interventions, it does not solve the problem of implementation in ECE classrooms. EBPs continue to be insufficiently applied in educational settings for young children, and many early childhood educators continue to report that they do not know how to implement them within the context of the ECE classroom settings (Farley et al., 2018; Purper, 2016). This problem with implementation remains a concern today, even after several free, easily accessible, high-quality websites and resources were made available in recent years to teach practitioners how to use EBPs. For example, with funding and support by the US Department of Education's Office of Special Education Programs (OSEP), the Frank Porter Graham (FPG) Child Development Institute developed the Autism Focused Intervention Resources & Modules (AFIRM), online resources to teach users the step-by-step process of planning, implementing, and monitoring the use of 27 EBPs (Wong et al.,

2015). However, despite growing efforts such as those of the FPG and others to synthesize the literature and provide teachers with resources and training on specific EBPs deemed practical for classroom implementation, a gap still exists between the research findings on effective EBPs and their actual implementation in classrooms.

The research literature has identified several barriers to the classroom implementation of EBPs (Buysse, Winton, Rous, Epstein, & Lim, 2012; Detrich & Lewis, 2012; Mattox & Kilburn, 2012; Odom, 2009; Purper, 2016). One barrier is that teachers are not adequately trained to search, evaluate, and use the online resources that are available to them (Buysse et al., 2012). Purper (2016) found that many teachers are not even aware that there are free, government-funded online training sites available for their use. Dunst (2009) argues that ECE teachers' inadequate preparation in pre-service programs, as well as insufficient in-service training, are contributing factors to teachers' lack of knowledge about EBPs in general. Another factor may be that the ECE teachers lack a true understanding of the vast array of needs that children with ASD may have or have negative perceptions about teaching children with ASD in general ECE classrooms (Al-Sharbati et al., 2015). Whaley (2002) found that although some teachers had sound general knowledge about the needs of children with ASD, they were not trained on how to use EBPs to address these needs.

### **Conclusion**

In summary, high-quality early education is vital for improving the learning, communication, and social skills of young children with ASD. When possible, these children also need to be able to develop these skills alongside their typical peers in

inclusive ECE classroom settings. Law requires the use of EBPs, and many researchers, agencies, and organizations in the field have conducted research and developed resources to provide teachers with literature, websites, and training modules to help them to accurately select and use EBPs to support the needs of these children. Although research has repeatedly shown that the targeted use of evidence-based interventions is critical for improving the communication skills of young children with ASD, ECE teachers continue to report issues with selecting and implementing EBPs. Therefore, the purpose of this study is to understand ECE teachers' perceptions and experiences with using EBPs to improve the functional communication skills of young children in inclusive settings.

## **CHAPTER II**

### **LITERATURE REVIEW**

The purpose of the present study was to examine ECE teachers' perceptions and experiences using EBPs to improve the functional communication skills of young children in inclusive settings. This chapter includes a review of the literature related to (a) the definition, prevalence, and history of autism, (b) communication skill deficits in children with ASD, (c) EBPs for improving the communication skills of preschool children with ASD, and (d) teacher training, preparation and perspectives on the use of EBPs.

The literature on specific EBPs for improving the communication skills of young children and ECE teachers' training and perspectives on their usage in inclusive classrooms discussed in this chapter were retrieved from an electronic search of scholarly articles and book chapters using the following databases: Academic Search Complete, Child Development and Adolescent Studies, CINAHL Plus with Full Text, Education Source, ERIC, PsycARTICLES, PsycINFO, Teacher Reference Center, CINAHL Complete. Terms used to retrieve the literature from these databases included preschoolers/young children, ASD/autism, and ECE/early childhood education, EBPs/evidence-based practices, functional communication, school setting/inclusive classrooms, ECE teachers' training on EBPs, and ECE teachers' perspective on EBPs. The terms used to retrieve articles on specific EBPs to target communication skills



among young children with ASD included the names of specific EBPs (e.g., discrete trial training, pivotal response), autism, preschool, and communication. All database searches on specific EBPs were limited to articles dated 2006 to present since the identification of EBPs gained momentum after the passage of IDEA in 2004 and the development of quality indicators for experimental research studies.

### **Definition, Prevalence, and History of ASD**

In this section, information with respect to definition, characteristics, prevalence, causes, diagnosis, and history of autism is presented.

#### **Definition and Characteristics**

Autism spectrum disorder (ASD) refers to a group of complex neurodevelopmental disorders characterized by a wide spectrum of deficits in social communication and interaction and repetitive and characteristic patterns of behavior (American Psychiatric Association [APA], 2013). It is termed as a neurological disorder because it affects the structure of the brain and how the brain and nervous system function, and as a developmental disorder because it interferes with development, and as a spectrum disorder because it is associated with a wide range of symptoms and degrees of severity among different individuals (APA, 2013).

IDEA defines ASD as a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three that adversely affects a child's educational performance (IDEA, 2004). Other behavioral characteristics may include engagement in restricted, repetitive, and stereotyped patterns of behavior, rocking back and forth, peculiar attachments to inanimate objects, resistance

to change in daily routines, and unusual responses to sensory experiences (National Institute of Neurological Disorders and Stroke [NINDS], 2017). The hallmark characteristics of ASD are present during early years and can potentially affect individuals' daily life functions throughout life.

Some children and adults with ASD are able to perform all activities of daily living with minimal or no support, while others require intensive support in order to perform basic activities (Gargiulo & Bouck, 2017). For example, toddlers with ASD may not imitate or respond to the actions of others, refrain from interacting with them during play, and instead play alone. They may not seek parental affection or comfort or respond to others' emotions in typical ways. Some children may exhibit more serious symptoms, which include crying or inappropriate behavioral outbursts, which can lead to disruptive and physically aggressive behavior. They may also exhibit self-injurious behaviors such as head banging, hair pulling, or self-biting (Gargiulo & Bouck, 2017).

Young children with ASD often appear unaware or disinterested in what is going on around them. Some prefer not to be held, cuddled, or touched, and may show little or no desire to interact or play with other children or adults. They may show no interest in pretend play or in learning the rules of basic preschool games. It is not uncommon for preschool children to not respond to or follow simple requests or directions from their teachers or peers, or ask and answer basic who, what, why, when and where questions. They may also avoid making eye contact with others, and may not respond to facial expressions, gestures and tones of voice (Centers for Disease Control and Prevention [CDC], 2018). These characteristics may not show up until children enter preschool. That

may appear to have age-appropriate communication skills at home, where language is contextualized and often predictable, but these difficulties become apparent upon beginning preschool because the social and academic demands are different from anything experienced before (Cross, 2011).

### **Prevalence, Causes, and Diagnosis**

**Prevalence.** Although five times more likely to occur among boys than among girls, ASD is being diagnosed in children around the world across all racial, ethnic, and socioeconomic backgrounds (Daniels et al., 2014). The CDC (2020) recently estimated that one out of every 54 eight-year-olds is currently diagnosed with ASD. This is an increase from estimates of one in every 59 children in 2014, one in 69 in 2012, one in 110 in 2006, and one in 150 in 2002 (CDC, 2012; Frith, 2012). These statistics indicate that the prevalence of ASD in the U.S. has almost doubled over the past decade. With more than 3.5 million individuals in the U.S. who are diagnosed with the disorder, ASD is now considered the fastest-growing developmental disability in the U.S (Buescher, Cidav, Knapp, & Mandell, 2014). The Autism Society of North Carolina reports that over 65,000 individuals with ASD live in North Carolina alone, and that one in every 57 eight-year-olds is currently diagnosed with the disorder (Autism Society of North Carolina, 2020).

**Causes.** Autism has continued to baffle scientists since it was first diagnosed in 1943 and has been the subject of massive research to understand its causes and find a cure for the condition (Rylaarsdam & Guemez-Gamboa, 2019). To date, research has been unable to pinpoint a sole cause for the disorder. Recent scientific studies have been

able to rule out some previously suggested causes, such as maternal characteristics, the presence of certain illnesses and infections during pregnancy, candidiasis and the use of the mumps, measles, rubella vaccine (Herbert, Sharp, & Gaudiano, 2008). However, new scientific evidence now suggests that heredity, certain genetic predispositions, medical problems, and various harmful environmental factors negatively impact the developing fetus, resulting in abnormal development in size, shape, and functioning of the brain (Murphy et al., 2016).

Although research has found patterns of ASD and related disabilities within families, no single identifying gene has been discovered to cause the disorder. It is known that ASD has a tendency to occur more often in children who have a sibling with ASD, who have older parents, and who have certain genetic or chromosomal conditions such as fragile X syndrome, neurofibromatosis, tuberous sclerosis, congenital rubella syndrome, Rett's Disorder, and untreated phenylketonuria (Herbert et al., 2008; N. L. Johnson, Burkett, Reinhold, & Bultas, 2016). Researchers are currently studying the possibility of irregularities in the way the DNA is inherited from the parents and is coded during a child's early fetal development (Courchesne et al., 2019). Researchers are also investigating the possibility of a cluster of certain unstable genes that may affect the development of the brain during the early development of the fetus (Grayson & Guidotti, 2016; Shpileva et al., 2018).

The presence of hazardous chemicals (e.g., arsenic, lead, manganese, mercury, pesticides, and solvents) were listed as chemicals that can harm the nervous system and contribute to an increased risk for ASD (Gilbert, Miller, Martin, & Abulafia, 2010).

There is also scientific evidence that viral infections, metabolic imbalances, and ingestion of certain drugs (e.g., valproic acid, thalidomide, misoprostol, Beta 2 adrenergic agonists, and antipyretics) during pregnancy are linked to ASD (Dietert, Dietert, & Dewitt, 2011).

**Diagnosis.** To date, no medical test has been developed to diagnose ASD. Instead, trained experts, such as a child neurologist, psychologist, psychiatrist, or physician must conduct a diagnostic evaluation to determine if a child has the qualifying characteristics for ASD. Because the hallmark characteristics of ASD often overlap with symptoms of other conditions and disorders, distinguishing ASD from other diagnoses can be challenging. Conditions that often coexist with ASD include allergies, asthma, epilepsy, bowel disease, gastrointestinal/digestive disorders, feeding disorders, depression, anxiety disorder, bipolar disorder, ADHD, OCD, sensory integration dysfunction, sleeping disorders, immune disorders, autoimmune disorders, and neuroinflammation (DeMayo, Glozier, & Guastella, 2017).

Although the characteristics of ASD may be observed during infancy, they usually become more detectable when the child is between the ages of 2 and 6 years old (CDC, 2016). Parents and care providers are usually the first to notice when a child is not reaching typical developmental milestones. One tool that is widely used for screening purposes is the Modified Checklist for Autism in Toddlers (M-CHAT; Autism Speaks, 2014). The M-CHAT was developed as an autism-specific screening tool for use when the child is 18 months old. It is completed by parents and other caregivers who interact with the child on a regular basis. If there are concerns, the pediatrician typically refers the child to a specialist for further evaluation. The specialist will conduct a comprehensive

autism-specific behavioral evaluation which may include one or more diagnostic tools, (e.g., the Autism Diagnostic Observation Schedule [ADOS], Autism Diagnostic Interview – Revised [ADI-R], Childhood Autism Rating Scale [CARS]) to determine if ASD is the cause for the delays in the child’s development (Barbaresi et al., 2006).

The American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (DSM) is the main diagnostic reference used by mental health professionals to conduct a formal diagnosis of ASD. The most recent edition, published in 2013 (DSM-V), provides guidelines for physicians to accurately diagnose ASD based on two main types of behavioral symptoms: impaired social communication and/or interaction, and restricted and/or repetitive behaviors. The identifying criteria include deficits in social-emotional reciprocity of both verbal and nonverbal communication and interactions with others, as well as restricted, repetitive patterns of behaviors, activities and interests. Four subcategories of ASD, including Rett’s Disorder, Childhood Disintegrative Disorder, Asperger’s Disorder, and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), are now all listed under one umbrella diagnosis of ASD (APA, 2013).

### **History of ASD**

It is important to look at autism from a historical perspective in order to understand how we have come to our current understanding, definition, and diagnosis of autism. The earliest scholarly account of the term autism dates back to 1867 when British psychiatrist Henry Maudsley used it to describe self-absorbed children with serious developmental delays and behavioral abnormalities. In 1907, Swedish psychiatrist Eugen

Beuler used the term to describe the egocentric behaviors, or “autism,” of patients with schizophrenia. In the United States, American child psychiatrist Leo Kanner (1943) used the term to describe 11 highly intelligent children with schizophrenia who exhibited language delays and abnormal, self-absorbed behaviors. He characterized the children as having no desire to interact with others and an obsession with adherence to certain stereotyped, repetitive behaviors and routines (Lam, 2013). At about the same time, Hans Asperger, a scientist in Germany, used the term to describe children with schizophrenia who had average intelligence as well as delayed language skills and behavioral abnormalities, although less dramatic. This condition, which came to be termed Asperger’s syndrome, has been considered to be a milder form of autism (Myers, 2008).

In the absence of any medical explanations for autism in the early 1900s, psychogenic theories (the notion that emotional and mental distress can cause a physical illness) influenced the common assumption that a mother’s lack of attachment and affection towards her child will cause the child to develop a personality disorder. This hypothesis, later coined as the “Refrigerator Mother” theory of autism, was first asserted by Kanner (1949) and became widely popular during the 1950s and 1960s (Laidler, 2004).

When the American Psychiatric Association (APA) published its first edition of the DSM-I in 1952, autism was considered as a mental disorder; children who exhibited what is now understood to be characteristics of ASD were at that time classified as having childhood schizophrenia (Evans, 2013). Thus, until the 1960s, clinical treatments for autism were primarily based on early forms of psychoanalysis techniques, Freudian-

based therapeutic methods for interpreting and treating psychological disorders (R. P. Hobson, 2014). Various methods to treat these children included placing the child in foster care, holding therapies to encourage mother-child bonding, institutionalization, psychoanalysis, psychotherapy, and dietary modifications.

After the 1960s, the use of medications (e.g., Lysergic acid diethylamide) and aversive behavior modification techniques such as electric shock therapy and inflicting pain and punishment to quell unwanted behaviors became popular (Wolff, 2004). These behavior modification treatments were developed by Ivar Lovaas. He conducted numerous research studies and authored or co-authored numerous scholarly papers on the use of imitation, discrimination training, and social reinforcement to establish spontaneous language in children with speech delays. He also authored several papers on use of systematic punishment to deter self-injurious behaviors (Smith & Eikeseth, 2011). His approaches were based on the learning theories of psychologists such as John B. Watson, Ivan Pavlov, and B. F. Skinner, whose contributions to the field of research had long established that behaviors can be measured, trained, and controlled through a system of rewards and punishments (Graham, 2010).

In the DSM-II (1968), the APA officially recognized ASD and its specific diagnostic characteristics, but the disorder was still listed as a childhood type of schizophrenia. A number of studies on ASD since the DSM-II highlighted several key characteristics distinguishing ASD from schizophrenia. These studies resulted in a shift in the medical field towards the idea that ASD is a biological and cognitive rather than a psychological disorder. As such, the APA officially recognized that ASD and



schizophrenia are two separate disorders in its release of the DSM-III (Evans, 2013). Sixteen years later, the DSM-IV included ASD as one of four separate disorders under the umbrella of pervasive developmental disorder (PDD): autistic disorder, Asperger's disorder, childhood disintegrative disorder, and pervasive developmental disorder – not otherwise specified (PDD-NOS; Sasson, Pinkham, Carpenter, & Belger, 2011). It was not until the release of the APA's most current edition, the DSM-V, that ASD became the umbrella under which the aforementioned subcategories of PDDs are classified, along with levels of severity based on the degree of supports required (Level 1- some substantial, Level 2 – substantial, or Level 3 - very substantial; APA, 2013; Autism Speaks, 2014).

### **Communication Skill Deficits in Children with ASD**

This section provides a review of the literature on communication as a cognitive process, its impact on child outcomes, and long-term outcomes for minimally verbal preschoolers with ASD.

#### **Communication as a Cognitive Process**

Being able to communicate with others is the foundation upon which meaningful social relationships are built (Woronko & Killoran, 2011). “Communication is a reciprocal, dynamic process. It is the instrumental force propelling social knowledge, relationships and a sense of self. An effective communicator has an inherent motivation to interact, something to express, and a means of communication” (Quill, 2000, p. 14). The communication of normal human thought first requires the desire or intent to communicate something. It also requires the communicator's assumption that the receiver

of that information will understand, react or respond to what is being communicated.

Next, the communicator must mentally construct the message and formulate mental words before they can be physically communicated, either as vocalizations, facial expressions, gestures, sign language, or typing. Messages may also express emotions by the tone and pitch of the vocalizations, as well as the negative or positive nature of various facial expressions, body movements, and gestures (Gordon et al., 2011).

Successful communication is dependent on the comprehension and interpretation of that message by the receiver. The receiver must pay attention to the sounds of the speaker's words, be able to make meaning, and be able to accurately interpret the intention of any nonverbal messages, such as body language, hand or signed gestures, Braille, or written or typed language (Gordon et al., 2011). Young children with ASD, depending on their intellectual and social development, may have limitations in any or all of these aspects involved in producing or understanding speech and language. In particular, because they may have deficits in appreciating social situations, young children with ASD may not feel any need to communicate with others and may not be capable of considering how other people may respond to their messages. In addition, they may have attention deficits that make it difficult to pay attention to auditory information. Therefore, children with ASD may need to be trained to pay attention when others speak because of difficulties with listening to and decoding others' words and phrases to make meaning (Gordon et al., 2011).

Because these communication deficits are highly variable from one child to the next, some young children with ASD are slow to begin talking, others seem to develop

normal speech, and still others develop little to no spoken language at all (Paul, 2008). Some children with ASD eventually develop the ability to verbalize words and phrases through the use of an elaborate vocabulary but may exhibit repetitive language; have narrow topic interests and exhibit an exceptional ability to talk about these topics. Others may exhibit uneven language development and poor nonverbal conversation skills, such as understanding and using nonverbal cues (i.e., gestures, eye contact, and facial expressions). Because some children will avoid making eye contact with others, they may appear disengaged, disinterested, or rude. Children who lack basic skills to express their feelings, thoughts, and needs often become frustrated and resort to communicating their wants and needs through vocal outbursts or other inappropriate behaviors (Kasari, Brady, Lord, & Tager-Flusberg, 2013).

### **Impact on Child Outcomes**

By definition, a deficit in communication skills is one of the defining characteristics of ASD (APA, 2013). That said, it is important to point out that communication deficits among young children with ASD are highly variable, and not a universal characteristic of the disorder (Gernsbacher, Morson, & Grace, 2016). For example, in one large-scale study of toddlers with ASD with a broad range of IQs, more than 75% were within the typical range of development for expressing their first words, while another 5% were still completely non-verbal at the age of six (Murphy et al., 2016). In two other large-scale studies of young children with ASD, some scored two years below age level while others scored nearly 2 years above age level on measures of expressive and receptive language (Fulton & D'Entremont, 2013; Hudry et al., 2010).

Nevertheless, delays in language development are among the most common reasons for referrals of children who are eventually diagnosed with ASD (Baird et al., 2008; Filipek et al., 1999; Tager-Flusberg, Paul, & Lord, 2005).

In a review of recent empirical research on language development in young children with ASD, Gernsbacher et al. (2016) found that the most consistently reported language delays are in producing and expressing language. The report cited multiple studies of young children with ASD with delays in speaking their first words (e.g., Charman et al., 2003; Matson, Mahan, Kozlowski, & Shoemaker, 2010); phrases (e.g., Grandgeorge et al., 2009; Kenworthy et al., 2012; Pry, Peterson, & Baghdadli, 2011); and grammatical utterances or sentences (e.g., Anderson et al., 2007; Wodka, Mathy, & Kalb, 2013). The review also cited multiple studies with findings that young children with ASD often have smaller expressive vocabularies than typically developing peers (e.g., Charman et al., 2003; Fulton & D'Entremont, 2013; Pistoljevic & Dzanko, 2017; Santrock, 2013; Siniscalco et al., 2012; Yoder & Stone, 2006). Other studies of language development in young children with ASD report delays in expressing concepts, producing grammatically correct sentences, and using rising intonation when asking questions (e.g., Fulton & D'Entremont, 2013; Hudry et al., 2010; Sutera et al., 2007; Vanvuchelen, Roeyers, & De Weerd, 2011; Walton & Ingersoll, 2013).

In general, speech-language impairments are the most common of all childhood disabilities, affecting 5-8% of all preschoolers (Prelock, Hutchins, & Glascoe, 2008). There is ample research indicating that language ability in early life is a strong predictor of long-term outcomes in social functioning, academic achievement, and mental health

(e.g., Anderson et al., 2007; Beitchman et al., 2001; Gillberg & Steffenburg, 1987; Kobayashi, Murata, & Yoshinaga, 1992; Venter, Lord, & Schopler, 1992). However, long-term outcomes are even more limited for children with language impairment and ASD compared to children with language impairment without ASD (Howlin, Mawhood, & Rutter, 2000). Likewise, language delays in school-age children with ASD are also strong predictors of long-term outcomes (Kobayashi et al., 1992; Lord & Paul, 1997; Rutter, 1970; Venter et al., 1992). In particular, children with low verbal comprehension and general language delay had significantly more behavior problems, and children with general language delays were consistently disadvantaged in later intelligence, reading, and behavior when they were reassessed at ages seven, nine and eleven (Silva, Williams, & McGee, 1987). In a study of 3-year-old preschoolers with developmental language delays, researchers found that early language delay was a significant predictor of lower than average intelligence, reading ability and increased behavior problems (Westerveld et al., 2017). In another study, researchers found that the consequences of untreated speech-language problems can lead to behavioral challenges, mental health problems, reading difficulties, and academic failure, including grade retention and high school dropout (Prelock et al., 2008). In several other studies, researchers found significant associations between language delays and severely restricted independence (Brignell et al., 2018; Venter et al., 1992; Whitehouse et al., 2009) and higher rates of self-injurious behavior, aggression, and property destruction (Dominick, Davis, & Lainhart, 2007; Park, Yelland, Taffe, & Gray, 2012).

### **Long-Term Outcomes for Minimally Verbal Preschoolers with ASD**

Some experts have estimated that as many as 80% of all young children with ASD who enter preschool and kindergarten are identified as minimally verbal (Carr & Felce, 2007). In a large-scale study on the verbal skills of preschoolers, Munson et al. (2008) found that the nonverbal IQs of children who are minimally verbal are highly variable. In another study (Rapin, Dunn, Allen, Stevens, & Fein, 2009), researchers found that while some children who are minimally verbal have both low receptive and low expressive language skills, other minimally verbal children have good receptive language skills. This suggests that verbal IQ and receptive language skills are not predictors of a child's expressive language skills (Tager-Flusberg & Kasari, 2013). However, Bal, Katz, Bishop, and Krasileva (2016) point out that because minimally verbal children with ASD are often assumed to have severe cognitive impairments, they are therefore largely excluded from testing due to difficulties conducting standardized assessment protocols on these children. As a result, minimally verbal children are rarely the focus of research and little is known about them (Kasari et al., 2013). In fact, researchers for the National Institutes of Health (NIH), recognizing the critical gap in the research on children who do not develop spoken language before the age of six, convened a multidisciplinary team in 2010 to begin gathering more empirical data on this subgroup and to identify future research opportunities to address these gaps.

There are also inconsistencies in how members of this group are defined (Tager-Flusberg & Kasari, 2013). In some cases, they have been defined as individuals whose vocalizations only include atypical non-speech sounds and a few vowel approximations.

In other cases, they have been defined as having extremely limited use with just a few infrequently used words or fixed phrases. Still other cases include individuals who primarily exhibit non-communicative vocalizations that are echolalic, stereotyped or scripted (Tager-Flusberg & Kasari, 2013).

Overall, a general lack of a single definition of ‘minimally verbal’ in the field has made it difficult to identify exactly how many children enter preschool with minimal verbal communication skills. In their data analysis on the speech of 1478 school-aged children identified as minimally verbal, Bal et al. (2016) used the defining criteria of five different instruments: (a) Autism Diagnostic Observation Schedule, (b) Autism Diagnostic Interview-Revised, (c) Vineland Adaptive Behavior Scales, 2nd Edition, (d) Parent Estimate of child language, and (e) Social Communication Questionnaire, commonly used in ASD to determine the consistency among these instruments to identify those children. The researchers found that the criteria among the different assessments were highly variable. Two of the assessments classified children as minimally verbal if they speak *single* or no words during the evaluation. Another assessment flagged child as minimally verbal if they speak *few* or no words. Two other assessments relied on parent reports of their child’s verbal language skills, one classifying a child as minimally verbal if he or she exhibited the verbal language of an 18-month-old, and the other classifying them as such if their language was equivalent to that of a 24-month-old. These findings show why estimates on the number of young children with ASD who are minimally verbal are so varied (Zeliadt, 2018).

Notwithstanding the lack of clarity on a single definition among researchers and instruments to define minimally verbal, an alarming finding in the literature review was that 25–30% of young children diagnosed with ASD will remain minimally verbal if they do not develop functional language by the age of six (Kasari et al., 2013; Klinger, Dawson, & Renner, 2002; Patten, Ausderau, Watson, & Baranek, 2013; Pickett et al., 2009; Tager-Flusberg & Kasari, 2013; Volkmar, Koenig, & State, 2005). Other estimates suggest that as many as 50% of children with ASD will never develop functional verbal communication skills (Fennell, Eriksson, & Gillberg, 2013). Although a few cases of later development of speech after the age of five have been reported, the general prognosis for these children is poor (Fountain, Winter, & Bearman, 2012; Pickett et al., 2009). In fact, studies indicate that children with ASD who remain non- or minimally verbal past the age of five have significantly poorer outcomes throughout school and on into adulthood (i.e., educational achievement, employment, the ability to live independently, and social relationships) compared to young children with ASD who do develop functional speech (Patten et al., 2013). Thus, it is extremely important that interventions are put into place as early as possible for these children (Pickles, Anderson, & Lord, 2014). While 25-30% is certainly more promising than 50%, this is a substantial number of children who may remain minimally verbal after age six if interventions are not put in place, so attention must be given to support their communication needs as soon as they enter preschool. Although a small percentage of children with ASD may still fail to acquire spoken language skills beyond a minimal level, in spite of access to these early interventions, it is the responsibility of practitioners to make every attempt to improve their outcomes



(Tager-Flusberg, 2014). The absence of speech or other means for communicating with others has serious consequences for these children, as they have multiple behavioral and medical needs, bear the most significant emotional and financial burdens, are at greatest risk for safety concerns, and are most in need of lifetime care with no possibility of independence (Tager-Flusberg, 2014).

### **EBPs for Improving Communication Skills of Children with ASD**

There is expansive evidence in the literature to support the positive effects of early intervention to improve the communication skills of young children with ASD (Dawson & Osterling, 1997; Ebbels, McCartney, Slonims, Dockrell, & Norbury, 2019; Hampton & Kaiser, 2016; R. L. Koegel & Koegel, 1988; Lovaas, 1987; Odom, Collet-Klingenberg, Rogers, & Hatton, 2010; Rogers & Vismara, 2008; Tager-Flusberg et al., 2005; Yoder & Stone, 2006). On average, these studies show that children with ASD significantly increase their use of spoken language following experimental early intervention with some, though sparse, evidence of long-lasting benefits. The fact that language development can be positively affected by early treatment has tremendous potential significance, because the emergence of spoken language is one of the most important variables predicting better outcomes in later childhood and adulthood (Gillberg & Steffenburg, 1987; Howlin, Goode, Hutton, & Rutter, 2004; Venter et al., 1992). Thus, given the role of language acquisition in shaping long-term outcomes, it has become important to identify the most successful strategies for facilitating language acquisition in young children with ASD, who uniformly demonstrate significant delays in at least some aspects of language and communicative development (Tager-Flusberg et al., 2005).

Research has repeatedly shown that early diagnosis and intensive interventions improve the learning, communication and social skills outcomes of young children with ASD (Barbaresi et al., 2006; Howlin et al., 2004; NICHD, 2014; Wilson, 2013). Providing intervention services as early as possible is critical, because the ability of the brain to form new connections is at its highest capacity to develop and redesign itself based on the child's experiences during the early years. "So, the idea is that a child with ASD has underlying deficits that affect the information they take in from the world; and if we can modify that, we may be able to minimize the effects of ASD" (Gordon, 2009, p. 25). In response to these findings, many home, clinical, and school-based instructional approaches have been developed and studied over the past 50 years in an attempt to improve the outcomes of young children with ASD between the ages of 0-5. Much of this research was dedicated to determining which intervention approaches, or components of those approaches, result in the best outcomes for young children with ASD (Autism Speaks, 2014). In particular, numerous studies contributed to the growing body of literature showing how early diagnosis and early intensive interventions have improved the learning, communication and social skills outcomes for young children with ASD (Barbaresi et al., 2006; Dawson et al., 2010; Gordon, 2009; NICHD, 2014).

### **EBPs in Early Childhood Education**

In this section, a brief history of EBPs in education is explained first followed by a description of how EBPs are identified. Next, a brief review of EBPs that can be used in inclusive ECE classrooms is provided. This section ends with a description of pre- and

in-service teacher preparation for the implementation of EBPs and teacher preparation in the State of North Carolina.

Gersten et al. (2005) define EBPs as interventions that have led to clear gains in skills following their implementation in a controlled research experiment. The U.S. Department of Education's Research and Training Center on Early Childhood Development (CED) defines EBPs as practices that are "informed by research, in which the characteristics and consequences of environmental variables are empirically established and the relationship directly informs what a practitioner can do to produce the desired outcome" (Odom et al., 2005, p. 142).

### **History of EBPs**

The use of EBPs actually began as a movement to improve research to practice gaps in the medical field in the 1990s. While earlier medical research had led to advancements in the effective treatment of patients, physicians were not always aware of these advancements. As a result, some physicians continued to treat patients with medications and procedures that had not been deemed appropriate by scientific research because they were not aware of the newer evidence-based medications and procedures that would lead to better patient outcomes (NAC, 2009).

The use of EBPs in public education did not become a mainstream concept until the passage of No Child Left Behind (NCLB) in 2002, and the reauthorization of the Disabilities Education Improvement Act (IDEA) in 2004. Both laws established a new requirement that all teachers' use scientifically based instructional strategies that have shown to be effective through research (Yell, 2012; Yell, Drasgow, & Lowrey, 2005). A

scientifically based practice refers to evidence-based interventions and approaches that have met rigorous standards and resulted in substantial positive outcomes for children (Zucker, 2004).

EBPs and approaches are those that are based on research that has been “systematically searched, critically appraised, and rigorously analyzed according to explicit and transparent criteria” (Davies, 2004, p. 7). IDEA (2004) includes multiple references to the use of scientifically based practices, curricula, and programs, and charges teachers with the responsibility of knowing how to identify and implement evidence-based instructional strategies (Simpson, Lacava, & Sampson-Graner, 2004). It also requires that schools provide teachers with training and resources to ensure they are able “to improve the academic achievement and functional performance of children with disabilities, including the use of scientifically based instructional practices, to the maximum extent possible” (Part 4, Section 1400 (C)(5)(E)).

### **Identification of EBPs in Special Education**

In response to the need to support teachers’ and other practitioners’ use of EBPs, the U.S. Department of Education established the Institute of Education Sciences (IES) to provide educators with the information they need to make evidence-based decisions. In 2002, a team of IES staff formed The What Works Clearinghouse (WWC) database to review the results from high-quality research, both to determine if high quality methods were used to answer the research questions being addressed in those studies, and to provide educators with a repository of those practices and interventions determined to be evidence-based based on the established criteria (IES, 2011). The WWC continues its

efforts to provide educators and other service providers with the information they need to make evidence-based decisions. By the end of 2017, the WWC had expanded its database to contain the reviews of over 10,000 studies (IES, 2017).

After the WWC's initial efforts, several other agencies and organizations began to work on developing resources for parents, educators, and practitioners to support development and learning of individuals with ASD. In 2009, under the guidance of a panel of nationally recognized scholars, researchers and other experts in the field, the National Autism Center (NAC) released the National Standards Report (NSR), which provided information on interventions that are supported by research to be effective EBPs. The goal of the NAC was to help to eliminate the confusion among families and educators about what is and what is not deemed evidence-based by providing specific guidelines on how to make choices about interventions. The NSR included a comprehensive review of the educational and behavioral intervention literature related to ASD between 1957 and 2007, and then compiled effective interventions based on age, diagnostic groups, and intervention targets. The panel then evaluated each study for methodological rigor using the Scientific Merit Rating Scale (SMRS), as well as intervention outcomes using the Intervention Effects Rating Scale (IERS), respectively (NAC, 2009, 2015). Finally, the panel analyzed the overall quantity, quality, and consistency of research findings for each intervention to determine if there was sufficient evidence in the literature to deem it effective for use with individuals with ASD (NAC, 2009, 2015). The NAC also gathered feedback from educators and parents at national and international conferences regarding the transparency of the resource. That information

was used to make improvements and updates to the NSR, and to develop additional dissemination projects and resources (e.g., a parent's guide and a professional's training guide). In 2015, the NAC updated the NRS with a new report, National Standards Project (NSP) phase II. In the NSP, the panel provided clarification for some of their terminology by replacing the term "treatment," which could be misinterpreted as a cure, with the term "intervention," to clarify that the individual or packaged strategies are not cures, but systematic changes in an individual's environment to modify their behavior.

A number of agencies, such as the National Research Council, the Department of Education's Office of Special Education Programs (OSEP), the National Professional Development Center on Autism Spectrum Disorder (NPDC), and the Autism Society of America also partnered with each other to develop professional resources for those who work with individuals with disabilities. For example, in 2007, the NPDC received funding from OSEP to compile information for practitioners to use to make evidence-based decisions in their practices. Their work involved a comprehensive review of the research literature to identify 27 evidence-based interventions for teachers from which to choose when working with young children with ASD (Office of Special Education and Rehabilitative Services [OSERS], 2018).

Unfortunately, providing teachers with access to a list of EBPs is only a starting point for educating teachers on appropriate interventions. Teaching young children with ASDs requires highly trained personnel who can support their needs by developing and delivering intensive, individualized programs of services using EBPs (A. J. Hobson, Ashby, Malderez, & Tomlinson, 2009). Because autism is a spectrum disorder, it

includes a widely heterogeneous group of individuals (Heflin & Simpson, 1998). Each student will respond differently to each intervention based on his or her specific needs. Therefore, teachers must understand how to implement each of the strategies as well as understand the individual needs of children in their classrooms in order to identify the most appropriate interventions. Nevertheless, many trained and licensed ECE teachers report that they hold low to moderate levels of knowledge of evidence-based strategies and feel inadequate at selecting and using the appropriate strategies to meet the needs of these children (Lobman, Ryan, & McLaughlin, 2005; McEntire, 2011).

According to the National Research Council (2001), many teachers lack adequate knowledge for selecting and implementing EBPs for young children with ASD because of the current structure of the professional development (PD) in schools. PDs are commonly presented as a one or two-day training with no post-PD practicing of skills, feedback, supervised experience or follow-up. PD without post-training implementation support does not allow for teachers to adequately learn new skills (Rakap, 2017). For example, Suhrheinrich (2011) reported that after conducting a 6-hour workshop on Pivotal Response Training, only 15% of the trainees were able to show mastery at implementing the intervention. However, after providing those teachers who had not reached mastery with post-training coaching and feedback, they made significant improvements towards mastery of the skill.

### **EBPs to Support Communication Skills in Inclusive ECE Classrooms**

In recent efforts to bridge the research to practice gap, a number of agencies and organizations have developed online PD modules to provide teachers and caregivers with

EBP resources and training for improving specific skill deficits. In 2014, when researchers at the Frank Porter Graham Child Development Institute (FPG) at the University of North Carolina at Chapel Hill began a multi-year project that resulted in one such online resource, Autism Focused Intervention Resources and Modules (AFIRM). The project began with a comprehensive review of the intervention literature to first identify the most effective EBPs for teaching children and youth with ASD between the ages of 0-22 years old. Researchers screened and evaluated 29,105 articles published between 1990 and 2011, from which 456 met methodological criteria for inclusion in the review. From the 456 studies that met the inclusion criteria, researchers identified 27 focused intervention practices that met the criteria for EBP and that could be practically implemented in a home, clinical, educational, or community settings (Griffin et al., 2017).

With funding and support by NPDC, the FPG research team developed AFIRM online resource to teach users step-by-step process of planning, implementing, and monitoring these EBPs. Parents, teachers, and practitioners are able to access the resource to learn the key components of each intervention. Each intervention module provides users with a thought-provoking case study to demonstrate the behavior or practice in use, as well as audio and video clips and interactive assessments. In addition, each module also offers teachers the option of earning a certificate for PD credits and licensure requirements (Sam, 2015).

Despite growing efforts such as those of the FPG team and other groups to synthesize the literature and provide teachers with resources and training on specific



EBPs deemed practical for classroom implementation, a gap still exists between evidence-based research and actual classroom practice. Anderson et al. (2018) point out that most teachers, in both special and general education, continue to report feeling ill-prepared to address the myriad needs that children with ASD in their classrooms require. Furthermore, in a recent research study regarding teacher fidelity with implementing EBPs, the findings indicated that teachers can learn to select and implement them; however, they require extensive training, coaching, time and resources to reach and maintain moderate implementation fidelity (Rakap, 2017; Stahmer et al., 2015). Anderson et al. (2018) attributed this in part to a lack of clarity in the research literature regarding which interventions are practical for classroom implementation. “Although many methodologically rigorous studies on interventions for children with ASD have been reported, their relevance to teachers is somewhat unclear” (Anderson et al., 2018, p. 3). The reality is that although a growing number of EBPs have been deemed effective for improving the outcomes of young children with ASD, these findings were based on studies conducted in clinical research settings. Less attention has been given to the practicality of implementing these EBPs in the classrooms (Sindelar, Brownell, & Billingsley, 2010).

Anderson et al. (2017) pointed out that Wong et al.’s (2015) review did not categorize EBPs by the settings (i.e., home, school, clinic) in which they were successfully implemented. In response to this critical information, they conducted a secondary analysis of each of the qualifying studies from Wong et al.’s (2015) review in order to determine which EBPs were actually implemented in typical K-12 school

settings. They classified a study as school-based only if the focused intervention was conducted in an in-use area of the school and excluded any studies where the intervention was conducted in an empty classroom or unused office space. The results of their secondary analysis revealed that many of the qualifying research studies were conducted in clinical or home settings, and less than a third of the studies, only 32%, were actually school-based.

Anderson et al.'s (2017) secondary analysis added to Wong et al.'s (2014) research on EBPs by showing which strategies were successfully implemented in a typical K-12 school setting, indicating their practicality for use in the classroom. Moreover, Anderson et al. (2017) reported that 14 of the identified EBPs were deemed effective for use with children aged 0-5 years old in classroom settings. However, Anderson et al.'s secondary review did not break down the information further to show which of those EBPs was implemented in the preschool classroom settings. A review of Anderson et al.'s review revealed that of 14 EBPs found to be effective for children between the ages of 0 and 5, 13 were found to be effective for preschool children who are between the ages 3 and 5 years, when implemented within the context of inclusive preschool programs. These included differential reinforcement, discrete trial training, exercise, functional communication training, modeling, naturalistic intervention, peer-mediated instruction and intervention, picture exchange communication system, pivotal response training, prompting, reinforcement, social skills training, and video modeling (see Table 1 for definitions).

Table 1

## The Definitions of the Evidence-Based Practices

Evidence-Based Practice	Definition
Discrete trial teaching (DTT)	Instructional process usually involving one teacher/service provider and one student/client and designed to teach appropriate behavior or skills. Instruction usually involves massed trials. Each trial consists of the teacher's instruction/presentation, the child's response, a carefully planned consequence, and a pause prior to presenting the next instruction.
Exercise (ECE)	Increase in physical exertion as a means of reducing problem behaviors or increasing appropriate behavior.
Social skills (SS)	Group or individual instruction designed to teach learners with autism spectrum disorders (ASD) ways to appropriately interact with peers, adults, and other individuals. Most social skill meetings include instruction on basic concepts, role-playing or practice, and feedback to help learners with ASD acquire and practice communication, play, or social skills to promote positive interactions with peers.
Differential reinforcement (DR)	Provision of positive/desirable consequences for behaviors or their absence that reduce the occurrence of an undesirable behavior. Reinforcement provided: a) when the learner is engaging in a specific desired behavior other than the inappropriate behavior (DRA), b) when the learner is engaging in a behavior that is physically impossible to do while exhibiting the inappropriate behavior (DRI), or c) when the learner is not engaging in the interfering behavior (DRO)
Functional communication training (FCT)	Replacement of interfering behavior that has a communication function with more appropriate communication that accomplishes the same function.

Table 1

Cont.

Evidence-Based Practice	Definition
Modeling (MD)	Demonstration of a desired target behavior that results in imitation of the behavior by the learner and that leads to the acquisition of the imitated behavior. This EBP is often combined with other strategies such as prompting and reinforcement.
Naturalistic intervention (NI)	Intervention strategies that occur within the typical setting/activities/routines in which the learner participates. Teachers/service providers establish the learner's interest in a learning event through arrangement of the setting/activity/routine, provide necessary support for the learner to engage in the targeted behavior, elaborate on the behavior when it occurs, and/or arrange natural consequences for the targeted behavior or skills.
Peer-mediated instruction (PMI)	Typically developing peers interact with and/or help children and youth with ASD to acquire new behavior, communication, and social skills by increasing social and learning opportunities within natural environments. Teachers/service providers systematically teach peers strategies for engaging children and youth with ASD in positive and extended social interactions in both teacher-directed and learner-initiated activities.
Picture Exchange Communication System (PECS)	Learners are initially taught to give a picture of a desired item to a communicative partner in exchange for the desired item. PECS consists of six phases which are: (a) "how" to communicate, (b) distance and persistence, (c) picture discrimination, (d) sentence structure, (e) responsive requesting, and (f) commenting.
Pivotal response training (PRT)	Pivotal learning variables (i.e., motivation, responding to multiple cues, self-management, and self-initiations) guide intervention practices that are implemented in settings that build on learner interests and initiative.

Table 1

Cont.

Evidence-Based Practice	Definition
Prompting (PP)	Verbal, gestural, or physical assistance given to learners to assist them in acquiring or engaging in a targeted behavior or skill. Prompts are generally given by an adult or peer before or as a learner attempts to use a skill.
Reinforcement (R+)	An event, activity, or other circumstance occurring after a learner engages in a desired behavior that leads to the increased occurrence of the behavior in the future.
Social narratives (SN)	Narratives that describe social situations in some detail by highlighting relevant cues and offering examples of appropriate responding. Social narratives are individualized according to learner needs and typically are quite short, perhaps including pictures or other visual aids.
Video modeling (VM)	A visual model of the targeted behavior or skill (typically in the behavior, communication, play, or social domains), provided via video recording and display equipment to assist learning in or engaging in a desired behavior or skill.

*Note.* Source: Wong et al. (2014)

In summary, the secondary analysis of the research literature showed that of the 27 focused interventions identified in the literature as EBPs, only 13 interventions may be practical for teachers to implement in the ECE classrooms to help young children with ASD who struggle to communicate their wants and needs. The 13 EBPs presented in Table 1 have therefore been selected for the current study.

## **Teacher Training, Preparation, and Perspectives on the Use of EBPs**

### **Pre-Service Efforts**

ASD became a recognized disability category since the reauthorization of IDEA in 1990. Prior to this law, young children with ASD received special education services under other disability categories. This most likely explains why, historically, coursework hours related to teaching young children with ASD were not included in states' credentialing requirements for professionals seeking licensure to work with children with special needs. Soon after ASD was added as a category, the nation began to see a significant increase in the identification of children with the disorder who required special education services (Bitterman, Mukamel, Malach, Fried, & Nelken, 2008; Boyd & Shaw, 2010). Yell et al. (2005) reported an increase from 5,415 young children during the 1991-1992 school year, to 65,424 young children during the 1999-2000 school year who were identified with ASD. This raised concerns regarding the lack of attention to ASD in personnel preparation programs, even though the disorder had been successfully litigated under IDEA (Yell et al., 2005). In 2009, the Council for Exceptional Children (CEC) developed a set of higher education standards for universities to use for preparing teachers for this disability category (Baker, 2012).

In 2011, to address concerns about ECE teachers' knowledge about ASD and their misperceptions about how to best support these children in their classrooms, a team of researchers conducted a study to examine the knowledge and attitudes of ECE preservice teachers regarding the inclusion of young children with ASD in preschool classrooms (Barned, Knapp, & Neuharth-Pritchett, 2011). The findings revealed that

although ECE teachers supported inclusion, they had mixed feelings about including children with more severe disabilities in their classrooms and were unclear about their roles in providing services to these children (Barned et al., 2011). A similar study (Shelton, 2013) explored self-efficacy beliefs of ECE preservice educators and their preparedness to teach young children with ASD. Findings of this study showed that although ECE teachers complete teacher training with high self-efficacy, they feel underprepared when faced with the challenges of teaching young children with ASD. Implications for the modifications in the teacher preparation programs included the need for preservice teachers to have increased experiences working with children with ASD as part of their course and fieldwork, the need to learn to collaborate with colleagues to help bridge gaps in their understanding about the needs of children with ASD, and the need for ongoing professional development (Shelton, 2013).

### **In-Service Efforts**

Early efforts to help teachers meet the needs of children with ASD led to the development and implementation of many different instructional approaches for teachers to use in various home, clinical, and school-based programs. Yet many ECE educators feel unprepared to deliver appropriate instruction for children with disabilities including those with ASD and often require support to successfully meet the children's unique needs (Rakap, 2017; Snyder et al., 2015). Mitchell and Hegde (2007) found that few teachers trained in general ECE have sound knowledge of special education or have the skills to teach children with disabilities in their classrooms (Mitchell & Hegde, 2007). Increasing numbers of children with ASD receive their education within inclusive ECE

settings (Brodzeller, Ottley, Jung, & Coogle, 2018). Teaching young children with ASD in the inclusive environments presents a unique set of challenges for teachers as they plan effective individualized instruction to meet their needs (Costley, Clark, & Bruck, 2014; Iovannone, Dunlap, Huber, & Kincaid, 2003). Many teachers report struggling to teach young children with ASD because they do not understand the broad range of characteristics of their disability, do not know how to communicate with them, and do not know which interventions and strategies have been deemed effective for improving their skills (Rakap, Balikci, & Kalkan, 2018; Simpson, de Boer-Ott, & Smith-Myles, 2003). Public school teachers often report receiving inadequate training and rate their personal efficacy in working with young children with ASD as low (Jennett, Harris, & Mesibov, 2003). This is especially a challenge for general education teachers who have received little or no formal pre-service training on using EBPs to teach young children with ASD in the inclusive classroom (NRC, 2001). They also may not have opportunities to receive in-service trainings to be able to teach these children effectively. Workshops and seminars offered to general ECE teachers as professional development is helpful for increasing knowledge level of teachers with respect to ASD; they, however, rarely help teachers to improve their practice with respect to planning and implementing interventions to meet the unique needs of children with ASD (Morrier, Hess, & Heflin, 2011; Snyder, Denney, Pasia, Rakap, & Crowe, 2011). With appropriate interventions, young children with ASD in inclusive settings are able to make significant gains in language, social, and cognitive skills (Strain & Bovey, 2011). Thus, as the number of young children with ASD in inclusive classrooms continues to rise, it is pertinent that



teachers know how to address the diverse needs of all their young children, including those with ASD (Busby, Ingram, Bowron, Oliver, & Lyons, 2012; Zigmond et al., 1997).

### **EC Teacher Preparation Efforts in North Carolina**

In 2012, there were 15,110 preschool teachers in the state of North Carolina licensed to teach preschool, with numbers projected to increase to 16,660 by 2020 (North Carolina Department of Commerce, 2012). The North Carolina Division of Child Development and Early Education (DCDEE), a division of the North Carolina Department of Health and Human Services (DHHS), oversees the North Carolina Pre-Kindergarten (NC Pre-K) Program. The NC Pre-K Program includes requirements for local ECE programs to provide high-quality classroom learning experiences to preschool children (North Carolina Division of Child Development and Early Education, 2019). NC Pre-K teachers must hold a bachelor's degree and a BK license from the North Carolina Department of Public Instruction to teach in public school settings (Friedman-Krauss et al., 2020). Head Start programs may also require their ECE teachers to have a BK license in North Carolina. The state's BK license is an inclusive teacher license, meaning that teachers are certified to teach both children with and without developmental delays in inclusive ECE classrooms (NC DHHS, 2020).

The North Carolina BK degree and license prepares ECE teachers to work with young children from birth to age 5, with and without disabilities, including children who are at-risk, as well as their families. The certification process requires coursework in a teacher preparation program and student teaching/internship to qualify for a NC Educator's Standard Professional initial license issued by the NC State Board of

Education's Department of Public Instruction. Once in the classroom, teachers who hold an initial license begin a three-year in-service induction process, which includes beginning teacher support and formal teacher evaluations as part of a professional development plan towards obtaining a North Carolina BK Standard Professional II license. ECE teachers working in the classroom without a BK license must be actively working toward obtaining the license or a BK or Preschool Add-on License, also issued by the North Carolina Department of Public Instruction (NC DHHS, 2020).

To prepare ECE teachers for the classroom, North Carolina undergraduate programs leading to a BK degree are interdisciplinary, allowing students to synthesize important knowledge and skills from the social and behavioral sciences, general education, and early childhood special education. Graduates of the program are prepared to teach children with and without disabilities in public school pre-kindergarten, and kindergarten classrooms. Post-Baccalaureate programs also provide graduate level courses for individuals who already hold a bachelor's degree and wish to obtain the BK Initial License only. In addition to coursework, all BK students, those working for licensure only or for a degree with a license, must participate in field experiences and gain student teaching experience in inclusive ECE settings to ensure they are prepared for working with children with diverse needs.

North Carolina has followed many of the national trends regarding young children with special needs. For example, according to the U.S. Department of Education Office of Postsecondary Education (2015), North Carolina was one of the states identified as having a special education teacher shortage in 2011-2015 . In fact, the need for highly

qualified ECE educators across the state is among the greatest in the nation. It is likely that many of the young learners enrolled in these ECE programs will be eventually referred for testing for special education services during their preschool years. However, teacher shortages in North Carolina have been identified as the most important reason for services not being provided to eligible children in a timely manner (Sutcher, Darling-Hammond, & Carver-Thomas, 2016). Thus, as the number of children who qualify for special education services in North Carolina rises, there is an increasing concern about the quality of the services they will receive.

Another issue of concern is the capacity for personnel in North Carolina's schools and ECE programs to meet the needs of children and families from diverse backgrounds. During the 2018-2019 school year, a total of 22,933 children were served across all grades under the disability of ASD, with 2,128 of these children enrolled in an ECE program for 3- to 5-year-olds. A total of 6,637 of all children across all disabilities, including children with ASD, were enrolled in ECE settings for at least ten hours a week and received the majority of their services at that location (U.S. Department of Education, National Center for Education Statistics, 2017). These numbers further emphasize the need for high quality ECE teachers in North Carolina who have the teaching credentials and sufficient training on implementing EBPs to serve them.

In the past, children with ASD were rarely placed in mainstream classrooms to learn alongside their typically developing peers. As a result of evolving legislation, educational initiatives, and research on the benefits of inclusion, today more than 95% of students with a varied range and severity of disabilities receive some or all of their

education in regular education classrooms, including ECE classrooms for 3- to 5-year-olds, when it is deemed by the IEP team to be the least restrictive learning environment for the child. Nevertheless, many teachers in the field report that they feel unprepared to meet the needs of these children (Lobman et al., 2005).

High quality teachers should have a good understanding of a typical child development and how children learn differently. They need to be willing to collaborate with families and other professionals to understand how to best serve young children. They must also know how to use both formal and informal assessments to determine these children's individual strengths and needs. Moreover, they need to know how to systematically implement high-quality individualized instruction using EBPs in order to address unique needs of these children (Gallagher, Steed, & Green, 2014).

These are competencies that teachers typically learn through their coursework and practicum experiences in accredited teacher preparation programs. However, in 2010, 16.4% of the ECE teachers in the state either lacked full certification, a degree, demonstrated competencies, or a combination of these; thus, they lacked the necessary credentials, knowledge, and skills to be considered highly qualified (TA&D Network, 2012; USDOE, 2010). This ranks North Carolina first in the nation for the highest number of professionals who are not highly qualified. Compounding this issue is that (a) less than 15% of elementary teachers in North Carolina identify themselves as being a member of a minority racial or ethnic group (National Center for Education Statistics, 2009), and (b) there are limited teacher training programs in the state to prepare teachers

to work with the growing number of children with disabilities who are from culturally and linguistically diverse backgrounds (NECTAC, 2012).

### **Teacher Perspectives on the Use of EBPs in the General ECE Classroom**

There is substantial research evidence to support the use of EBPs to improve the outcomes of learners with ASD in the ECE classrooms. Furthermore, federal law requires that ECE teachers use evidence-based interventions and practices to ensure the best outcomes for these students. In spite of this, inclusion of children with disabilities in early childhood settings remains a struggle for many ECE teachers (Bricker, 2000; Leiber et al., 2000; Mulhivill et al., 2002; Odom, 2000; Purcell, Horn, & Palmer, 2007). There has been little research to understand why ECE teachers are not adopting EBPs when working with learners with ASD in inclusive ECE classrooms (Morrier et al., 2011). In a study, Villines (2011) investigated teacher perceptions of the supports needed to be able to fully include children with special needs in ECE classrooms, and concluded that teachers need experiences, knowledge, and support to be able to fully provide them with the services they need. However, this study did not focus on the inclusion of children with ASD. Two studies were conducted in 2015 to understand the perspectives of leaders and practitioners on the barriers to inclusion, with findings of a number of contributing factors such as (a) conflicting definitions of inclusion, (b) a lack of understanding of how to implement best practices, (c) a lack of familial communication and support, (d) negative impact on all learners, and (e) the lack of professional development (Kozleski, Yu, Satter, Francis, & Haines, 2015; Sailor et al., 2015). However, neither of these studies focused on ECE teachers' perspectives. Another study, Morgan (2017) aimed to

understand the perspectives and attitudes of both the leaders and teachers in an early childhood center in the Midwest United States regarding the education of children with ASD in inclusive settings. The researcher found that both leaders and practitioners generally gave positive responses regarding empathy, trust, planning, instruction, and accommodating learners' needs, but found that positive perspectives on including children with ASD in the general ECE classroom only applied to children where issues with compliance, engagement, and reciprocity were not an issue. The study concluded that teachers' beliefs and attitudes towards the inclusion of learners with ASD depended on the cognitive and communication capabilities of the child (Morgan, 2017). To date, there have been no research study to our knowledge with a primary focus on the perspectives of ECE teachers with regard to the effectiveness of EBPs to support the communication needs of young children with ASD in inclusive settings.

### **Rationale for This Study**

A rise in autism over the past several decades has had a staggering impact on our nation's schools (Buescher et al., 2014). Children identified with ASD require an intensive, individualized program of services that includes EBPs delivered by highly trained personnel who can implement these practices with fidelity to support development and learning of these children. However, recent reports indicate there continues to be a research to practice gap with regard to classroom implementation of EBPs for improving these children's development and learning. Most teachers, in both special and general education, continue to struggle to meet the myriad needs that a child with ASD requires within the classroom. The fact that teachers continue to struggle to

implement EBPs to teach young children with ASD despite the abundance of literature on their effectiveness is a central concern facing the field of education today. ECE teachers report feeling that there is a lack of clarity regarding which interventions are most appropriate to target a specific deficit and are practical for implementation in the ECE classrooms (Farley et al., 2018).

One of the core characteristics of ASD is a deficit in communication skills. In particular 30% of children who enter preschool lack functional communication skills (Tager-Flusberg & Kasari, 2013). This is a critical concern because a child's inability to express his or her basic wants and needs is often cited as a root cause of behavior problems and social communication delays. Furthermore, research shows that children who do not develop functional communication before the age of six often never develop these skills (Patten et al., 2013; Pickett et al., 2009).

A secondary analysis of the literature has identified 13 EBPs that are effective for improving the functional communication of young children with ASD within the context of inclusive preschool classrooms. However, more research is needed to better understand the barriers to effective implementation of these EBPs in authentic inclusive ECE classroom settings. This study, therefore, aims to add to the current literature regarding the use of EBPs in ECE inclusive classrooms. Specifically, this study focuses on teachers' attitudes and experiences with using any of the 13 aforementioned EBPs identified as being effective for improving functional communication skills of preschool children within inclusive ECE classrooms.

### **CHAPTER III**

### **METHODOLOGY**

The purpose of this study is to gather information from certified early childhood education (ECE) teachers in order to understand their perceptions and experiences with using evidence-based practices (EBPs) to improve functional communication skills of young children with ASD spectrum disorder (ASD) in inclusive classrooms. Specifically, this study aims to better understand the research to practice gap between the EBPs that have been deemed most effective by research and what is actually being implemented in inclusive ECE classrooms to improve functional communication skills of young children with ASD. The central questions guiding this research are:

1. What are the relationships among ECE teachers' beliefs, knowledge and training on EBPs?
2. What EBPs do ECE teachers perceive to be most effective for addressing functional communication needs of young children with ASD in inclusive classroom?
3. What challenges do ECE teachers experience when implementing EBPs with young children with ASD in inclusive classrooms?
4. What supports do ECE teachers receive while implementing EBPs?



This chapter is organized into the following subsections: Research Design and Rationale, Participants, Procedure, Data Collection and Analysis, Issues of Trustworthiness and Pilot Study.

### **Research Design and Rationale**

This study was a mixed methods design using an online survey with all participants (quantitative) followed by qualitative face-to-face or telephone interviews with a subset of participants. Many social scientists argue that major problem areas should never be studied exclusively using only one research method (Terrell, 2012). Using a mixed methods approach adds value to the study by increasing the validity of the findings and allows the researcher to gain a deeper and broader understanding of the phenomenon (Hurmerinta-Peltomaki & Nummela, 2006). In addition, a mixed methods design gives researchers more confidence in analyzing and interpreting the results. Anytime a researcher can confirm the finding by triangulating two or more independent data collection methods, it reduces the uncertainty of the interpretation (B. Johnson, 2007). It also helps the researcher cultivate ideas for future research and gives readers more confidence that the study's findings are valid (Morse & Chung, 2003; O'Cathain, Murphy, & Nicholl, 2010; Tashakkori & Teddlie, 2003). As Brandwein and Filiano (2000) explain, the quantitative findings in a research study only provide overall numbers and frequencies. The data do not explain why, how, or what actually happened in the lives of the participants. Thus, collecting quantitative data using surveys and then gathering qualitative data via face-to-face or telephone interviews will allow for a more

in-depth understanding of ECE teachers' perspectives and experiences with using EBPs in their classrooms.

This approach to data collection follows what is described by Creswell, Plano Clark, Gutmann, and Hanson (2003) as a convergent parallel design. The quantitative and qualitative data were collected simultaneously, analyzed separately, and then merged and compared in the final analysis (Clark & Ivankova, 2016). This design was appropriate because the goal of the study was to synthesize quantitative and qualitative data to better understand teachers' perspectives and to produce more insightful and generalizable results (Creswell, 2013).

According to Creswell and Plano-Clark (2011), researchers should have at least one clear reason as to why they have chosen a particular mixed method design for their research study. They suggested that researchers who are new to conducting mixed methods studies use a typology-based approach to select the design for their study. "Typologies provide the researcher with a range of available options to consider that are well defined, facilitate the researcher's use of a solid approach for addressing the research problem, and help the researcher anticipate and resolve challenging issues" (Creswell & Plano-Clark, 2011, p. 60).

The convergent parallel design best fits the needs of this study for three reasons. First, the convergent parallel design provides completeness and explanation in that it allows the researcher to use the qualitative interview data to clarify any questions that may come up during the analysis of the quantitative survey data. Information gathered in the interviews allows the researcher to explain the findings of the study in detail. Second,

the convergent parallel design has greater credibility because it employs two different data collection methods to enhance the integrity of the findings (Demir & Pismek, 2018). The mixed methods convergent parallel design used in this study is depicted in Figure 1.

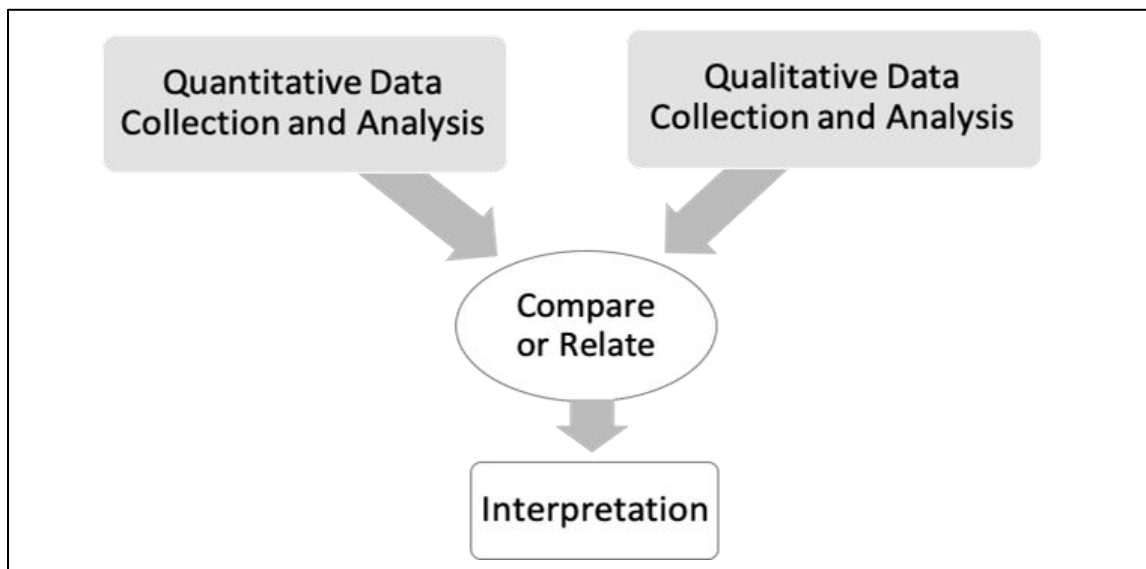


Figure 1. Convergent Parallel Strategy (Creswell, 2013).

### **Participants**

Participants of this study included 65 ECE teachers who work with children with ASD across the state of North Carolina. All 65 teachers completed the survey (quantitative data collection) and six participated in the interview (qualitative data collection). In this section, descriptions of procedures used to recruit teachers and characteristics of participating teachers are presented.

### **Teacher Recruitment**

The main goal during the recruitment process was to recruit licensed ECE teachers with various experiences and perspectives to answer the research questions.

Criterion sampling procedures, a type of purposeful sampling, were used to recruit participants for this study. It helps the researcher to identify information-rich participants as it involves recruiting individuals based on their knowledge or experience with a phenomenon of interest using EBPs to teach young children with ASD (Creswell & Plano-Clark, 2011). In addition to knowledge and experience, Bernard (2002) and Spradley (1979) emphasize the importance of availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner.

The lead researcher recruited participants for the study through email and phone contacts with ECE program coordinators in public school districts across the state North Carolina. In addition, the researcher called and sent follow-up emails to Head Start program directors across North Carolina using the Head Start Center Locator, provided online by the Administration for Children and Families (ACF), a division of the Department of Health & Human Services (HHS). Because childcare centers earn the most points towards star ratings when staff members have a degree, the researcher decided to focus on centers with 4 or 5 star ratings in order to increase the likelihood of finding licensed teachers. Therefore, the researcher contacted the directors of 4 and 5 star childcare centers using the childcare center search engine provided by the North Carolina Division of Health and Human Services Division of Child Development and Early Education (<https://ncchildcaresearch.dhhs.state.nc.us/search.asp?lang=English>).

The purpose of the introductory and follow-up correspondence was to describe the aim and details of the study, answer any questions the directors or coordinators had

about the study, and to request that they forward the recruitment letter attached to the email to all ECE teachers in their programs. The email sent to the directors/coordinators stated that by forwarding the recruitment letter to their ECE teachers, they were consenting to their participation in the study. The introductory email was sent to public and private preschool coordinators/directors in 33 counties across North Carolina. The program coordinators/directors from 5 of the 33 counties contacted responded via email that they did not have inclusive preschool classrooms as part of their ECE programs.

Coordinators/directors from six counties responded via email to decline participation in the study. No response was received from the coordinators/directors of nine counties. The remaining 12 coordinators/directors responded via email to verify their approval and to provide the requested number of certified ECE teachers working in inclusive settings in their programs, and that they had forwarded the attached recruitment letter to those teachers. Overall, coordinators/directors reported that they had emailed the recruitment letters to a total of 92 certified ECE teachers. Of those 92 teachers, 65 (26 from private schools and 39 from public schools) completed the only survey, a response rate of 70%.

The recruitment letter emailed to the ECE teachers explained the purpose of the study and included a call for all practicing ECE teachers who met the recruitment criteria to volunteer to participate in the study. The letter stated that all participants who took the online survey would receive a \$5 gift card for once they submitted the survey. The recruitment letter ensured teachers of the confidentiality and anonymity of their

participation and responses throughout the study, and that by receiving the forwarded letter from their director they had been given permission to participate.

In order to meet the criteria for participation in the study, participants were required to confirm that they: (a) currently held a valid early childhood educator license issued in the state of North Carolina, (b) were aged eighteen years or older, (c) worked in an inclusive preschool classroom in a Local Educational Agency (LEA), Head Start Program, or local child care center, and (d) worked with one or more children with ASD within the last three years. The recruitment letter also contained a statement at the bottom explaining that by clicking on the link to go to the survey, participants were confirming that they met the criteria to participate, and that they gave their consent to participate.

The survey took approximately 20-30 minutes for teachers to complete. At the end of the survey, before participants clicked the submit button, participants were asked if they were willing to also participate in an interview, and in turn receive an additional \$20 gift card. If participants agreed to be interviewed, a box popped up asking them to type in their contact email so that the researcher could contact them to schedule the interview. All participants were directed to click on the submit button at the end of the survey. This linked them to a new page where they were asked to enter their email address to receive the \$5 gift card for completing the survey. Of the 65 participants who completed the survey, six volunteered to participate in the interview. They were later contacted by the researcher at the email address they provided in order to schedule an interview. All participants who clicked yes were contacted and interviewed for the study.

### Characteristics of Participants

The participants in the study consisted of 65 licensed ECE teachers who were White (56.9%), Black (32.3%) or other (10.8%). On average, participants had at least 3 years of experience working with one or more children with ASD in an inclusive preschool classroom: 1-5 (38.5%), 6-10 (38.5%), 11-15 (16.9%), 16-20 (9.2%) 21 or more (9.2%). Participants' total years of experience as licensed ECE teachers ranged from 3 to 25 years, with a mean of 10 years ( $SD = 6.82$ ). See Table 2. This is commensurate with the latest Workforce Report by the North Carolina Child Care Services Association, which found that ECE teachers are typically employed by their centers for 4 years and have been in the ECE field for 12.2 years (Child Care Services Association, 2015).

Table 2

Characteristics of Participants ( $N=65$ )

Variables	Percent
Gender	
Female	100.0
Race	
White	56.9
Black	32.3
Other	10.8
Ethnicity	
No – Hispanic	89.2
Yes – Hispanic	9.3
Yes – Spanish	1.5

Table 2

Cont.

Variables	Percent
Number of students with autism	
1-5	26.2
6-10	38.5
11-15	16.9
16-20	9.2
21 or more	9.2

### Study Procedures

The present study was conducted in two phases. In the phase I, a survey was developed and completed by ECE teachers serving children with ASD to collect data on their personal beliefs, knowledge, training, and experience concerning EBPs to support the functional communication skills of young children with ASD. Upon completing data collection through the survey, teachers were interviewed using the interview protocol developed by the researcher. In this section, first, the survey and interview protocol are described, followed by the data collection procedures used in each phase.

### Survey Instrument

The researcher developed the survey used to collect quantitative data. The first section of the survey, *Individual Characteristics*, included five multiple-choice and two open-ended questions aimed at gathering demographic information from the participants. The information obtained in this section included teachers' gender, race, ethnicity, total years of experience as a licensed teacher and as a licensed ECE teacher, and the total



number of young children with ASD they had ever taught and were currently teaching. The second section of the survey, *Personal Beliefs*, gathered information about teachers' general beliefs and perspectives regarding the use of EBPs to teach young children with ASD. Teachers rated their level of agreement with four statements regarding the use of EBPs with young children in inclusive ECE classrooms on a 5-point Likert-type scale, with 1 indicating *Strongly Disagree* and 5 indicating *Strongly Agree*. The third section of the survey, *Knowledge, Training, and Experience*, asked teachers questions using the same Likert-type rating scale to gather information about their perceived level of knowledge, training, and experience using EBPs. The section also contained one multiple-choice question about the number of research articles on EBPs they had read in the past year.

The fourth section of the survey, *EBPs for Functional Communication*, asked ECE teachers about any benefits and challenges they had experienced while implementing any of the 13 EBPs included in this study. These EBPs were identified through a secondary analysis of research literature and found to be effective for addressing the functional communication needs of young children with ASD in typical classroom settings, and included the following: *discrete trial teaching, exercise, social skill, modeling, naturalistic intervention, peer-mediated instruction, pivotal response training, prompting, reinforcement, video modeling, differential reinforcement, functional communication training, and picture exchange communication system*. Each of the questions about the 13 EBPs had three subsections: *Knowledge, Implementation, and Barriers*. The *Knowledge* subsection included a multiple-choice question that asked

teachers how much they knew (never heard of, some knowledge, adequate knowledge, or extensive knowledge) about that intervention. The second subsection, *Implementation*, asked teachers if they had ever used the intervention while working with one or more young children with ASD to target communication skills. If they responded *no*, then there were no additional questions. If they responded *yes*, they were then asked to answer an additional multiple-choice question about the overall effectiveness of the intervention when it was adapted in any way, and/or the overall effectiveness of the intervention when it was implemented exactly as directed. The third Likert-type question in this subsection asked teachers to rate their agreement with a statement that they foresaw using that intervention in the future to target the communication needs of their young children with ASD.

The third subsection, *Barriers*, provided teachers with a list of eight categories of possible barriers to implementation of that particular EBP (*class size, insufficient time, lack of resources, lack of pre-service training, lack of in-service training, lack of confidence, lack of trust in the EBP research, not applicable to needs of the students*) plus an ‘other’ category with a provided space for teachers to type in an alternative response. Teachers were then asked to select the top three barriers, if any, to implementation of that EBP in ECE classroom (see Appendix A for the survey).

### **Interview Protocol**

The qualitative interview protocol consisted of open-ended questions that were developed using an interview guide and aligned with the study’s research questions. An interview guide lists the questions or issues that will be explored in more depth during the

interviews and ensures that the interviewer asks all participants the same main questions, and additional guiding and probing questions if necessary, to gain in-depth information and insights about the phenomena being investigated (Patton, 2015). First, the researcher brainstormed possible relevant open-ended interview questions that would provide a deeper understanding of topics being researched. Next, the researcher shared the draft interview guide with two co-advisors for their feedback and suggestions, and edits were made based on their feedback. The revised interview guide was then used in the pilot study with one ECE teacher, who provided feedback towards a second round of edits to the final version of the interview guide.

The finalized interview protocol consisted of a total of eleven questions (see Appendix B). The purpose of the first three questions was to get a deeper understanding of teachers' personal experiences, thoughts and opinions regarding the characteristics and needs of the young children with ASD that they have worked with in their classrooms, including any functional communication limitations. The next five questions asked teachers to describe their use of EBPs with young children with ASD in their classrooms. These questions asked them about how they selected and used EBPs in general and with regard to the 13 EBPs identified as effective for targeting functional communication skills. Teachers were asked to elaborate on the successes and challenges they had experienced when implementing any of the 13 EBPs in their classrooms.

The last three questions asked teachers to elaborate more on one, if any, of the 13 EBPs that they had found success with and to reflect on what contributed to that success. Examples were provided when probing was needed to evoke teacher reflection (e.g., their

knowledge and experience, the specific needs of their young children with ASD, practicality of implementation in the inclusive preschool settings, classroom dynamics, staff support and resources, administrative or program directives). Teachers were also asked to share their opinion of the EBP that is the most effective overall for improving the functional communication skills of young children with ASD, and to explain their thinking, as well as any EBP they felt is not at all practical for use in inclusive early childhood classrooms, and why.

### **Data Collection**

Quantitative data using the survey were collected by employing an online survey platform, Qualtrics within a four-month period. Once the survey was designed and participants agreed to participate in the study, an electronic link was sent to the participants. Participants were given two weeks to complete the survey and an e-mail to remind participants to complete the survey was sent at the end of the two weeks. At the end of the 4-month period, all survey answers were then downloaded from Qualtrics to process for data analysis. Data was stored on a Box folder, a web-based password-protected storage. Participants who entered their contact information if they were willing to be interviewed were assigned pseudonym names. To maintain confidentiality, the researcher also kept a master list that linked the interviewees' names and pseudonyms to their assigned survey numbers, which was stored in a drive separately from the data. All participant data was made available only to the researcher and faculty advisors. Once the survey data were analyzed, interviews were conducted with six ECE teachers who volunteered to participate. The researcher scheduled the interviews using e-mail

communications. Interviews were conducted either face to face or via telephone, depending on the preference of the participants. Two teachers participated in face to face interviews at a local coffee shop convenient to their location. Two teachers participated in face to face interviews in their ECE classrooms outside of their teaching day. Two participants were interviewed by phone. At the start of each face-to-face or phone interview, the researcher explained the purpose of the study again, reviewed and reconfirmed that the participant's pre-signed consent to participate, and answered any questions they had. The duration of the interviews ranged from 40 to 62 minutes with a mean duration of 50.5 minutes.

## **Data Analysis**

### **Analysis of Survey Data**

Data obtained from the survey were entered into IBM® SPSS Statistics version 24 to conduct data analysis. Descriptive analyses were conducted to examine the demographic characteristics of participants, their personal beliefs, knowledge, training and experience in relation to use of EBPs to teach young children with ASD. Descriptive analyses were also used to examine benefits and challenges teachers experienced while implementing any of the 13 EBPs included in this study. In addition, a Pearson correlation analysis was used to test the relationship between the continuous variables, teacher characteristics (i.e., knowledge, training, and teaching experience) and their perspectives about EBPs (i.e., personal beliefs).

### **Analysis of Interview Data**

The interviews were audiotaped and then transcribed word-for-word using the MS WORD program. Transcription is a verbatim depiction of all communication between the researcher and teacher during the interview meeting (Oliver, Serovich, & Mason, 2005), to ensure that the researcher has accurate written data for conducting the analysis. The researcher conducted the transcription and made sure to remove all confidential information (e.g., names, identifiers such as the year taught) prior to data analyses. For reliability, the transcriptions were then crosschecked between the researcher and a fellow doctoral student majoring in special education who was trained by the researcher. After the initial review of the transcripts was completed, they were shared with each participant individually to ensure it accurately reflected the participants' perspectives and interview discussion. All participants approved the transcript of their interview with no requests for changes. The participant or respondent validation (Birt, Scott, Cavers, Campbell, & Walter, 2016) helped ensure that the researcher's understanding of the participants' responses was accurate. Once the transcripts were approved by the participants, the researcher analyzed the data using constant comparison analysis to identify common themes to answer relevant research questions.

A deductive thematic approach was used to analyze the qualitative interview data (Creswell, 2013). The first step, familiarization, involved the organization and preparation of the data by digitally combining the transcripts into one ongoing document, conducting a thorough reading of the text, and taking initial notes. In Step 2, generating themes, the researcher predetermined them to be analyzed based on each of the four

research questions of the study. In Step 3, coding, the researcher assigned color codes for highlighting the transcribed interview responses for each predetermined theme. By color coding the text, the researcher was able to easily reference and locate the information to be used in the data analysis. In Step 4, reviewing themes, the researcher checked to see that the predetermined themes would accurately capture what was present in the data, and developed subthemes that emerged from teacher's responses. In Step 5, defining subthemes, the researcher compiled all highlighted text for each of the four research questions into four coding indices. Within each index, teachers' comments were then sorted into the thematic subcategories regarding how they related to the theme. For example, responses coded for the predetermined theme of *Reported Experience Working with Children with ASD* were copied and pasted from the transcript into the appropriate row of the index depending on which of the four subthemes it applied to—successes in the field; experiences with a child's progress; student-teacher ratios; or meeting a child's individual needs. Step 6 involved interpreting the data within each theme to determine how it could be used to inform the qualitative narrative and answer the four research questions. This included using quotes from participants to provide a detailed explanation of the findings that were identified and highlighted in the transcript. Areas of divergence across themes and subthemes, when they arose, were also analyzed for later discussion.

### **Issues of Trustworthiness**

The validity and reliability of research studies involving qualitative methods of data collection and analysis are dependent on the trustworthiness of the evaluator and the different stakeholders involved in the study. Trustworthiness “is up to the researcher and

research participants who attempt to build validity into the different phases of the research from data collection through to data analysis and interpretation” (Zohrabi, 2013, p. 258). Strategies such as rich description, member checking, triangulation, peer review, providing an audit trail, and researcher reflexivity are effective ways to strengthen the trustworthiness in qualitative data (Merriam, 1998; Tracy, 2010). Creswell (2013) recommends using a combination of strategies to strengthen the validity and reliability of a study’s findings. The strategies used to avoid issues of trustworthiness in this study included triangulation, member checking, and providing an audit trail (Merriam, 1998; Morse, Barrett, Mayan, Olson, & Spiers, 2008; Tracy, 2010).

### **Triangulation**

Triangulation in research refers to the utilization of more than one approach for answering the research question (Maxwell, 2013). The aim of triangulation is to increase confidence in the findings by collecting and comparing data from two or more independent measures. This study incorporated a cross-examination of ECE teachers’ responses from the online surveys in phase I and the interviews in phase II of the research in order to corroborate and strengthen the researcher’s understanding and interpretation of the data, as well as the trustworthiness of the findings. This strategy “strengthened credibility by broadening the aspects of the case and allowing the researcher to seek ‘rival explanations’ from the data” (Yin, 2012, p. 14). “Gathering data through one technique can be questionable, biased and weak. However, collecting information from a variety of sources and with a variety of techniques can confirm findings” (Zohrabi, 2013, p. 258).



**Member Checking**

According to Maxwell (2013), member checking is “the most critical of all the steps in a study for establishing credibility” (p. 127). Member checking involves gathering feedback from the participants on the data collected to ensure that the researcher’s interpretations are accurate. This step ensures the credibility of the information provided by the participants. Member checking may involve having the participants view the raw data (e.g., transcriptions or observational field notes) to verify that it is accurate. In this study, member checking was conducted for data collected through interviews. Each participant was provided with a transcript of the verbatim interview discussion to verify its accuracy and request changes if needed. This allowed the researcher to validate the raw data before analysis and interpretation begins.

**Audit Trail**

The researcher provided an audit trail via email of all data collected from the participants for readers to be able to understand exactly what was asked and the responses provided by the participants. Each interview was audiotaped and transcribed verbatim by the researcher. Once each transcription was completed, it was sent via email to the participant for review to ensure that their interview responses were accurately transcribed. This ensured the accuracy and reliability of the data and trustworthiness of the study (Merriam, 1998). Once the transcribed interviews were approved by the participants, the researcher began the data analysis process.

### **Pilot Study**

In addition to the aforementioned strategies, the researcher conducted a pilot study, a small-scale test of the methods and procedures to be used in the actual study (Porta, 2008). Specifically, the purpose of the pilot study was to find out any flaws that may exist in the survey questions developed by the researcher to gather data from the ECE teachers. The aim of the pilot study was to ensure the validity, reliability and practicality of the survey questions teachers were asked. A validity check ensured that the survey questions gathered the specific information needed to answer the research questions. The validity checks asked respondents, via a feedback form, to analyze each question and advise the researcher of any questions they did not clearly understand. A validity check tested out the online format of the survey to ensure that it worked as expected to collect the data. The practicality check looked at any time and convenience factors that may deter teachers from opting to participate in the survey (Krishnaswamy, Sivakumar, & Mathirajan, 2006). Three ECE teachers who met the criteria for participation participated in the pilot study. After completing the survey, the participants were emailed a feedback form regarding the survey. The form asked participants to discuss any issues they may have experienced with the survey itself, such as problems with the wording of questions, answering questions that did not seem applicable to the study, and any time and convenience concerns. The survey protocol was revised to address the concerns reported by these teachers prior to conducting the dissertation study.

The interview process was also tested with one of three participants involved in the pilot study. At the end of the interview, the participant received an interview feedback

form to complete. The feedback form asked the participant to discuss any issues she may have experienced with the interview itself, such as problems with the wording of questions, answering questions that did not seem applicable to the study, and any time and convenience concerns.

### **Post-Pilot Study Modifications**

**Online survey revisions.** Three ECE teachers (all female) from one childcare center in North Carolina completed the online survey during the pilot study in 10 to 17 minutes ( $M = 13$ ). Participants responded that the survey was not too long to complete. They also stated the questions were clear and there was no misunderstanding about what each question was asking. A few modifications were made to improve the survey. First, an instruction was added to section four of the survey, EBPs for Functional Communication, to clarify how to answer the questions in relation to Implementation subsection. Additional revisions were made in relation to how questions were presented in Qualtrics. For example, if a participant reported that she never implemented any of the 13 EBPs listed, then no further questions would pop up asking them about their experience administering that EBP. In addition, one participant reported that she was not sure about the names of some of the interventions; therefore, she did not respond to them. Thus, a description for each EBP was added to the survey.

**Interview revisions.** The pilot interview was conducted with one ECE teacher, the interview lasted 45 minutes, which was adequate to answer the interview questions and within the expected time submitted to the IRB. The participant reported that the interview questions were clear and related to the survey. However, at the time of the pilot

interview, the participant could not remember each of the 13 EBPs. Therefore, interviewees were provided a printed copy of the description of EBPs at the time of the interview to assist them in their discussion. In addition, the order of interview questions was changed based on the feedback received from the interviewee.

## **CHAPTER IV**

### **RESULTS**

The purpose of this mixed-methods study was to understand early childhood education (ECE) teachers' perceptions and experiences using evidence-based practices (EBPs) to improve the functional communication skills of young children in inclusive settings. A convergent parallel design was used in the present study. The researcher first analyzed the quantitative data collected from 65 ECE teachers through online surveys followed by an analysis of the qualitative data collected from six of those ECE teachers through one-to-one interviews. The following research questions guided this study:

1. What are the relationships among ECE teachers' beliefs, knowledge and training on EBPs?
2. What EBPs do ECE teachers perceive to be most effective for addressing functional communication needs of young children with ASD in inclusive classroom?
3. What challenges do ECE teachers experience when implementing EBPs with young children with ASD in inclusive classrooms?
4. What supports do ECE teachers receive while implementing EBPs?

In this chapter, first, the results of the quantitative analyses are presented by each research question followed by the presentation of the results for the qualitative analyses.

### Quantitative Analysis

#### Research Question 1: ECE Teachers' Beliefs, Knowledge, and Training about EBPs

Correlation analyses were conducted to determine the associations between teacher characteristics (i.e., knowledge, training, and teaching experience) and their beliefs about EBPs. Table 3 presents the results of descriptive analysis for these variables.

Table 3

Descriptive Statistics for Teachers' Beliefs, Knowledge and Training

	SD	D	N	A	SA	
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>M</i>
<b>Belief</b>						
Necessity of using EBPs to teach children with ASD	1 (1.5)	0 (0.0)	6 (9.2)	21 (32.3)	26 (40)	4.31
Ease of implementation of EBPs	0 (0.0)	2 (3.1)	14 (21.5)	19 (29.2)	17 (26.2)	3.98
Helpfulness of EBPs in supporting children	1 (1.5)	1 (1.5)	11 (16.9)	20 (30.8)	20 (30.8)	4.08
Teacher confidence to review literature implement EBPs	1 (1.5)	3 (4.6)	10 (5.6)	22 (33.8)	18 (27.7)	3.98
<b>Knowledge and Training</b>						
Sufficient training in EBPs in preservice level	3 (4.6)	4 (6.2)	16 (24.6)	12 (18.5)	16 (24.6)	3.67
Ongoing PD support to implement EBPs	0 (0.0)	7 (10.8)	13 (20)	19 (29.2)	12 (18.5)	3.78
Keeping up with the current literature about EBPs	1 (1.5)	3 (4.6)	10 (15.4)	22 (33.8)	18 (27.7)	3.98

Note. SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree, *M*=Mean

**Beliefs about EBPs and experience.** Teachers were surveyed to determine their beliefs regarding the necessity of EBPs in general, ease of implementation of EBPs, helpfulness of EBPs in determining how to best support communication needs of young children with ASD, and their confidence to identify resources to implement EBPs. These responses were then examined for possible associations with teaching experience as measured in years licensed at any grade level and years licensed in an early childhood classroom. The results of these analyses revealed no significant correlations between teachers' beliefs and their teaching experience (see Table 4).

Table 4

Correlations Between Teachers' Perspectives and Years of Teaching Experience ( $N=65$ )

	Total years teaching	Years teaching early childhood
Necessity of using EBPs to teach children with ASD	-0.049	-0.065
Ease of implementation of EBPs	0.022	0.001
Helpfulness of EBPs in supporting children	-0.005	0.039
Teacher confidence to review literature implement EBPs	-0.013	0.083

**Beliefs about EBPs and training.** Results of the data analyses revealed significant correlations among teachers' beliefs about EBPs and their training (see Table 5). Positive relationships were noted between perceived teacher training during pre-service education and their beliefs. More specifically, teachers' beliefs about their pre-

service training were found to be positively correlated with their beliefs on the necessity of using EBPs in general ( $r = 0.319, p = 0.024$ ), the ease of implementation of EBPs ( $r = 0.470, p = 0.001$ ), the helpfulness of EBPs in determining how to best support communication needs of young children with ASD ( $r = 0.456, p = 0.001$ ), and their confidence to identify resources to implement EBPs ( $r = 0.413, p = 0.001$ ). This suggests that teacher beliefs about EBPs were higher when teachers believe their preservice training sufficiently prepared them to use EBPs in the early childhood classroom.

Table 5

Correlations Between Teachers' Perspectives, Knowledge, and Training ( $N=65$ )

	Preservice Teacher Preparation	Ongoing Professional Development	Review of Current Research
Necessity of using EBPs to teach children with ASD	.319*	.383**	.428**
Ease of implementation of EBPs	.470**	.520**	.553**
Helpfulness of EBPs in supporting children	.456**	.523**	.396**
Teacher confidence to review literature implement EBPs	.413**	.529**	.508**

Note. \* indicates  $p < .05$ . \*\* indicates  $p < .01$ .

Moderate correlations were also found between teachers' beliefs about EBPs and professional development (PD) provided to them by their center/program. More specifically, PD was positively correlated with their perspectives on the necessity of



using EBPs in general ( $r = 0.383, p = 0.006$ ), the ease of implementation of EBPs ( $r = 0.520, p = 0.000$ ), the helpfulness of EBPs in determining how to best support communication needs of young children with ASD ( $r = 0.523, p < 0.001$ ), and their confidence to identify resources to implement EBPs ( $r = 0.529, p = 0.001$ ). This indicates that teacher beliefs about EBPs were higher when their center/program provided PD adequately prepared to use EBPs in inclusive classroom.

Finally, moderate correlations were identified between teachers' beliefs about EBPs and their self-learning/training through the review of current research findings about EBPs to teach young children with ASD. More specifically, teacher self-learning/training was found to be positively correlated with their perspectives on the necessity of using EBPs in general ( $r = 0.428, p = 0.002$ ), the ease of implementation of EBPs ( $r = 0.553, p < 0.001$ ), the helpfulness of EBPs in determining how to best support communication needs of young children with ASD ( $r = 0.396, p = 0.005$ ), and their confidence to identify resources to implement EBPs ( $r = 0.508, p < 0.001$ ). This points out that teacher beliefs about EBPs were higher when keeping up with current research findings about EBPs, appropriately prepared them to use EBPs in their classroom.

### **Research Question 2: Perceived Effectiveness of EBPs**

The researcher compiled and analyzed all survey responses related to research question 2 in order to determine which of the 13 EBPs ECE teachers found most effective for improving the functional communication skills of young children with ASD. For each EBP, only participants who responded that they had previously implemented it were prompted with additional questions about its effectiveness, barriers to its implementation,

and the likelihood of using it again in the future. Descriptive statistics were calculated to analyze data for this question. Table 6 presents ECE teachers' perceived level of knowledge about EBPs. Table 7 present ECE teachers' reported use of EBPs.

Table 6

ECE Teachers' Level of Knowledge About EBPs ( $N=65$ )

EBP	Knowledge Level			
	Never heard <i>n</i> (%)	Some <i>n</i> (%)	Adequate <i>n</i> (%)	Extensive <i>n</i> (%)
PECS	4 (6.2)	11 (16.9)	19 (29.2)	17 (26.2)
Modeling	1 (1.5)	6 (9.2)	17 (26.2)	24 (36.9)
Differential reinforcement	4 (6.2)	9 (13.8)	17 (26.2)	17 (26.2)
Social skills	1 (1.5)	5 (7.7)	13 (20.0)	27 (41.5)
Peer-mediated instruction	1 (1.5)	12 (18.5)	19 (29.2)	14 (21.5)
Video modeling	1 (1.5)	12 (18.5)	13 (20.0)	20 (30.8)
Pivotal response training	12 (18.5)	12 (18.5)	9 (13.8)	13 (20.0)
Reinforcement	3 (4.6)	7 (10.8)	16 (24.6)	20 (30.8)
Naturalistic intervention	10 (15.4)	10 (15.4)	14 (21.5)	12 (18.5)
Prompting	2 (3.1)	4 (6.2)	14 (21.5)	26 (40.0)
FCT	8 (12.3)	9 (13.8)	14 (21.5)	15 (23.1)
Exercise	4 (6.2)	7 (10.8)	9 (13.8)	26 (40.0)
Discrete trial teaching	15 (23.1)	8 (12.3)	9 (13.8)	14 (21.5)

*Note.* ECE = Early Childhood Education, EBP = Evidence-based Practice, PECS = Picture Exchange Communication System, FCT = Functional Communication Training.

Table 7

ECE Teachers' Use of EBPs ( $N=65$ )

EBP	Used (Yes)	Ineffective	Somewhat Effective	Very Effective	Future Use (Yes)
PECS	38 (58.5)	0 (0)	15 (39.5)	18 (47.4)	27 (71.1)
Modeling	44 (67.7)	0 (0)	12 (27.3)	31 (70.5)	38 (86.4)
DR	34 (52.3)	1 (2.9)	15 (44.1)	18 (52.9)	27 (79.4)
Social skills	44 (67.7)	0 (0)	8 (18.2)	35 (79.5)	38 (88.6)
PMI	32 (49.2)	1 (3.1)	13 (40.6)	18 (56.3)	28 (87.5)
VM	22 (33.8)	0 (0)	7 (31.8)	14 (63.6)	19 (86.4)
PRT	21 (32.3)	0 (0)	7 (33.3)	14 (66.7)	17 (80.9)
Reinforcement	40 (61.5)	0 (0)	12 (30.0)	28 (70.0)	34 (85.0)
NI	25 (38.5)	0 (0)	9 (36.0)	16 (64.0)	22 (88.0)
Prompting	43 (66.2)	0 (0)	10 (23.3)	32 (74.4)	37 (86.1)
FCT	27 (41.5)	0 (0)	8 (29.6)	19 (70.4)	24 (88.9)
Exercise	36 (55.4)	0 (0)	6 (16.7)	30 (83.3)	32 (88.9)
DTT	19 (29.2)	0 (0)	2 (10.5)	17 (89.5)	7 (36.8)

*Note.* ECE = Early Childhood Education, EBP = Evidence-based Practice, PECS = Picture Exchange Communication System, DR = Differential Reinforcement, PMI = Pivotal Response Training, VM = Video Modeling, PRT = Pivotal Response Training, NI = Naturalistic Intervention, FCT = Functional Communication Training, DTT = Discrete Trial Teaching

**Picture exchange communication system (PECS).** A total of 47 out of 65 teachers (72.3%) reported that they had at least some knowledge of PECS. Only 38 teachers (58.5%) reported using PECS in their classrooms. Of these 38 teachers, almost all responded that they found PECS to be either somewhat (39.5%) or very effective (47.4%), with a mean score of 2.55 ( $SD = .51$ ). Moreover, most (71.1%) reported they would likely use PECS again in the future ( $M = 4.23$ ,  $SD = .97$ ).

**Modeling (MD).** A total of 47 out of 65 teachers (72.3%) reported they had at least some knowledge of modeling and 44 of 65 teachers (67.7%) reported that they had actually implemented it. Of these 44 teachers, almost all responded that they found modeling to be either somewhat (27.3%) or very effective (70.5%), with a mean score of 2.72 ( $SD = .45$ ). Moreover, 38 of the 44 teachers (86.4%) responded they would likely use modeling again in the future ( $M = 4.36$ ,  $SD = .82$ ).

**Differential reinforcement (DR).** A total of 43 out of 65 teachers (66.2%) reported that they had some knowledge of DR and 34 of 65 (52.3%) reported that they had used it in their classroom when working with children with ASD. Of these 34 teachers, almost all responded that they found DR to be either somewhat (44.1%) or very effective (52.9%) with a mean score of 2.50 ( $SD = .56$ ). Of these 34 teachers, 27 (79.4%) reported they would likely use DR again in the future ( $M = 4.28$ ,  $SD = .73$ ).

**Social skills (SS).** A total of 45 of 65 teachers (69.2%) reported that they have at least some knowledge of SS and 44 of 65 teachers (67.7%) reported that they had used it to support the needs of young children with ASD in their classrooms. Of these 44 teachers, almost all responded that they found SS to be either somewhat (18.2%) or very effective (79.5%) with a mean score of 2.81 ( $SD = .39$ ). Moreover, most teachers who had used SS in the past (88.6%) responded they would likely use it again in the future ( $M = 4.55$ ,  $SD = .63$ ).

**Peer-mediated instruction (PMI).** A total 45 of 65 teachers (69.2%) reported that they had at least some knowledge of PMI and only 32 of 65 teachers (49.2%) reported that they had used PMI with children with ASD in their classrooms. Of these 32

teachers, almost all responded that they found PMI to be either somewhat (40.6%) or very effective (56.3%) with a mean score of 2.53 ( $SD = .57$ ). In addition, nearly nine out of 10 teachers who had used PMI (87.5%) reported they would likely use PMI again in the future ( $M = 4.29$ ,  $SD = .86$ ).

**Video modeling (VM).** A total 45 of 65 teachers (62.2%) reported that they had at least some knowledge of VM, but only 22 of 65 teachers (33.8%) reported using VM in their classrooms while working with young children with ASD. Of these 22 teachers, almost all responded that they found VM to be either somewhat (31.8%) or very effective (63.6%) with a mean score of 2.67 ( $SD = .48$ ). Moreover, 19 of the 22 teachers (86.4%) reported they would likely use VM again in the future ( $M = 4.43$ ,  $SD = .68$ ).

**Pivotal response training (PRT).** A total of 34 of out 65 teachers (52.3%) reported they had at least some knowledge of PRT, but only 21 teachers (32.3%) responded that they had actually used PRT in their classrooms to support children with ASD. All 21 teachers found PRT to be either somewhat (33.3%) or very effective (66.7%) with a mean score of 2.67 ( $SD = .48$ ). Out of the 21 teachers who previously used PRT, 17 (80.9%) reported they would likely use PRT again in the future  $M = 4.24$ ,  $SD = .77$ ).

**Reinforcement (R+).** A total of 43 out of 65 teachers (66.2%) reported that they had at least some knowledge of reinforcement. Only 40 teachers (61.5%) reported using reinforcement in their classrooms. Of these 40 teachers, almost all responded that they found reinforcement to be either somewhat (30%) or very effective (70%) with a mean

score of 2.70 ( $SD = .46$ ). Moreover, 34 teachers (85%) reported they would likely use reinforcement again in the future ( $M = 4.36$ ,  $SD = .78$ ).

**Naturalistic intervention (NI).** A total 36 of 65 teachers (55.4%) reported that they had at least some knowledge of NI, but only 25 teachers (38.5%) responded that they had actually used it when working with children with ASD in their classrooms. Of these 25 teachers, almost all responded that they found NI to be either somewhat (36%) or very effective (64%) with a mean score of 2.64 ( $SD = .49$ ). Moreover, 22 of the 25 teachers (88%) reported they would likely use NI again in the future ( $M = 4.32$ ,  $SD = .80$ ).

**Prompting (PP).** A total of 44 out of 65 teachers (67.7%) reported that they had at least some knowledge of prompting. Only 43 teachers (66.2%) reported using prompting in their classrooms. Of these 43 teachers, almost all responded that they found prompting to be either somewhat (23.3%) or very effective (74.4%) with a mean score of 2.76 ( $SD = .43$ ). In addition, 37 teachers (86.1%) reported they would likely use prompting again in the future ( $M = 4.22$ ,  $SD = .85$ ).

**Functional communication training (FCT).** A total of 38 out of 65 teachers (58.5%) reported they had at least some knowledge of FCT, but only 27 teachers (41.5%) responded that they had actually used FCT in their classrooms to support children with ASD. Of these 27 teachers, responded that they found FCT to be either somewhat (29.6%) or very effective (70.4%) with a mean score of 2.70 ( $SD = .46$ ). Moreover, 24 teachers (88.9 %) reported they would likely use FCT again in the future ( $M = 4.26$ ,  $SD = .66$ ).

**Exercise (EX).** A total of 42 out of 65 teachers (64.6%) reported that they had at least some knowledge of exercise. Only 36 teachers (55.4%) reported using exercise in their classrooms. Of these 36 teachers, almost all responded that they found exercise to be either somewhat (16.7%) or very effective (83.3%) with a mean score of 2.83 ( $SD = .38$ ). Moreover, most (88.9%) reported they would likely use exercise again in the future ( $M = 4.54$ ,  $SD = .66$ ).

**Discrete trial teaching (DTT).** A total of 31 out of 65 teachers (47.7%) reported they had at least some knowledge of DTT, but only 19 of 65 (29.2%) reported they had actually implemented it. Of these 19 teachers, almost all responded that they found DTT to be either somewhat (10.5%) or very effective (89.5%) with a mean score of 2.89 ( $SD = .32$ ). Only seven of the 19 teachers (36.8%) who had used DDT in the past reported they would likely use it again in the future ( $M = 4.63$ ,  $SD = .50$ ).

### **Research Question 3: Challenges Encountered When Implementing EBPs**

Teachers who reported the use of a specific EBP were asked to identify the top three barriers to successful implementation of that EBP. The following choices were provided: (a) large class size, (b) time, (c) lack of resources, (d) lack of teacher preparation/pre-service training, (e) lack of ongoing school/center professional development, (f) lack of confidence in ability, (g) lack of belief/trust in the EBP and (h) not applicable to the specific needs of the child. Teachers could also select “other” option and provide a barrier that was not listed. Figure 2 presents the top three barriers encountered by teacher when implementing various EBPs.

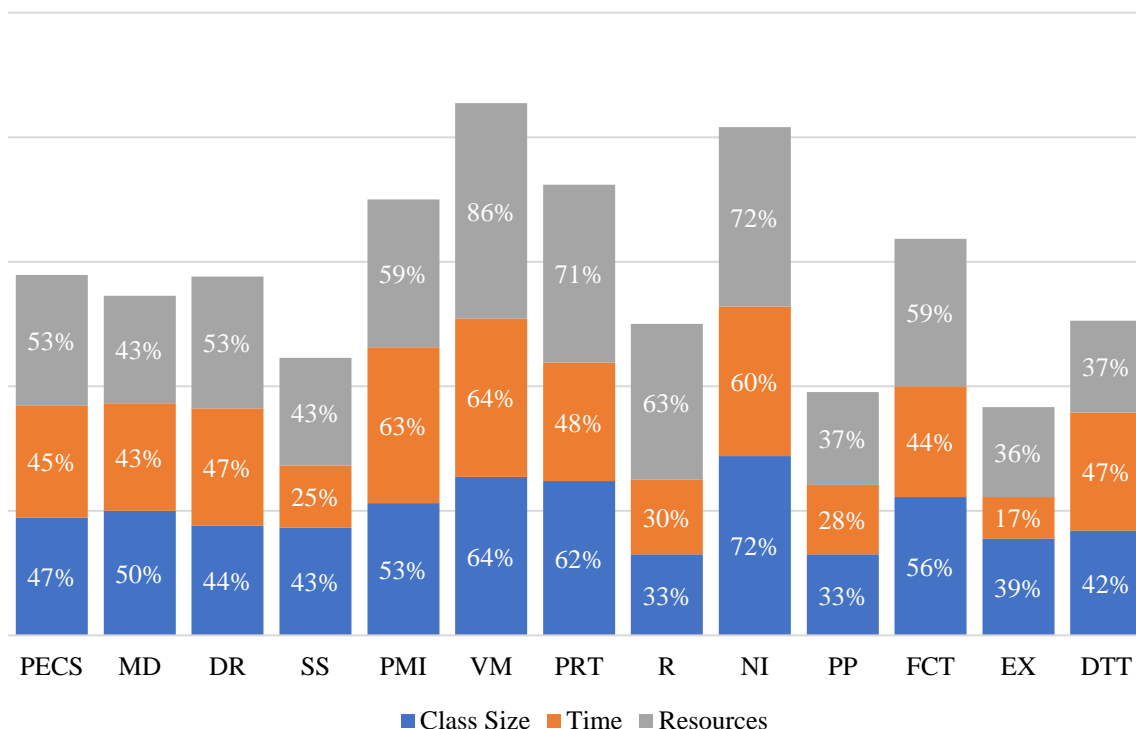


Figure 2. Top Three Barriers Teachers Encounter When Implementing Each EBP. PECS = Picture Exchange Communication System, MD = Modeling, DR = Differential Reinforcement, SS = Social Skills, PMI = Peer-Mediated Instruction, VM = Video Modeling, PRT = Pivotal Response Training, R+ = Reinforcement, NI = Naturalistic Intervention, PP = Prompting, FCT = Functional Communication Training, EX = Exercise, DTT = Discrete Trial Teaching.

**Top three barriers for each individual EBP.** The top three barriers for the implementation of PECS as reported by 38 teachers were class size (21.5%), resources (20%) and previous training (20%). Of the 44 teachers who reported using modeling in the past, the most frequently noted barriers were class size (33.8%), resources (29.2%), and time (29.2%). The top three barriers for the implementation of differential reinforcement as reported by 34 teachers were resources (27.7%), time (24.6%), and class size (23.1%). The top three barriers for the implementation of social skills training as reported by 44 teachers were class size (32%), resources (30%), and time (18%). The top



three barriers for the implementation of peer-mediated instruction as reported by 32 teachers were time (30.8%), resources (29.2%) and class size (26.2%). The top three barriers for the implementation of video modeling as reported by 22 teachers were (29.2%), previous training (24.6%), and class size (21.5%) or time (21.5%). The top three barriers for the implementation of PRT as reported by 21 teachers were resources (23.1%), previous training (21.5%), and class size (20%). The top three barriers for the implementation of reinforcement as reported by 40 teachers were class size (21.5%), resources (20%), and previous training (20%). The top three barriers for the implementation of naturalistic instruction as reported by 25 teachers were class size (27.7%), resources (27.7%), and time (23.1%). The top three barriers for the implementation of prompting as reported by 43 teachers were class size (21.5%), resources (20%), and previous training (20%). The top three barriers for the implementation of FCT as reported by 27 teachers were resources (24.6%), class size (23.1%), and previous training (20%). The top three barriers for the implementation of exercise as reported by 36 teachers were class size (21.5%), resources (20%), and previous training (20%). The top three barriers for the implementation of DTT as reported by 19 teachers were professional development (21%), previous training (18.5%), and confidence (15.4%).

**Most frequently reported EBP barriers.** Overall, the most frequently selected barriers for the implementation of EBPs by teachers across all 13 practices were lack of resources ( $n = 224$ ), large class size ( $n = 200$ ), and time ( $n = 173$ ). Teachers also selected “other” 15 times, but the number of the responses actually related back to a lack of

resources. For example, one teacher who selected other with regard to barriers implementing PECS stated that funding was needed to acquire the materials. Another participant listed special equipment was needed for gross motor exercise. Moreover, another teacher explained that a barrier to VM is acquiring the necessary equipment to record videos. Frequencies for all perceived barriers across all EBPs are presented in Figure 3.

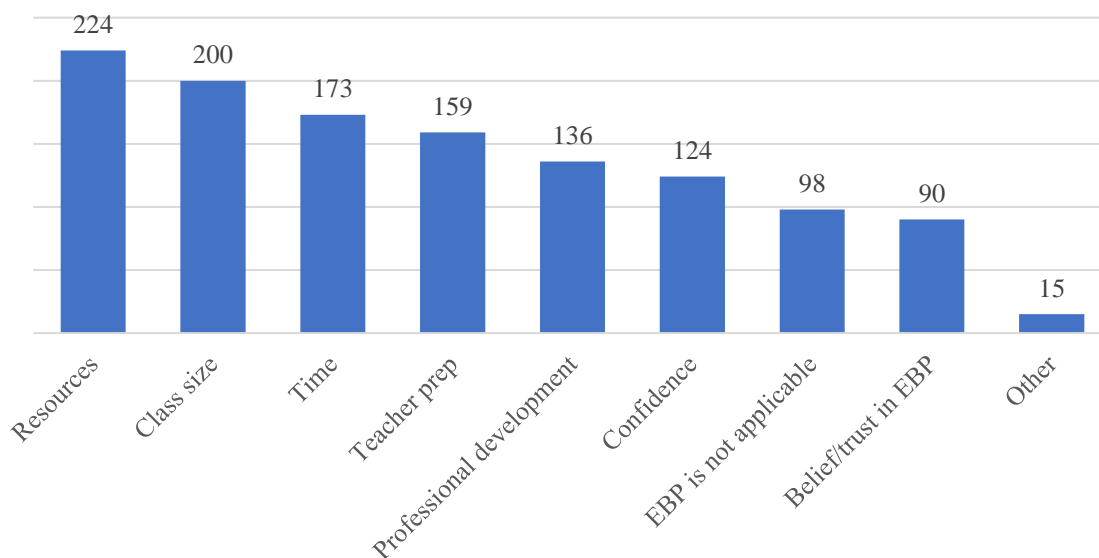


Figure 3. Reported Barriers Encountered When Implementing EBPs.

#### **Research Question 4: Levels of Support Provided to Teachers While Implementing EBPs**

Teachers who reported using any given EBP in the past were also asked to rate the frequency (*never, sometimes, often, or always*) to which they had received any support from their center or program to help them select and implement EPBs in general. The most frequently offered support was support from related service providers (68% often/always) followed by supports regarding access to technology (50%). Extra time for

lesson planning (33%) and training opportunities for EBPs (41%) were the least frequently offered support to teacher while implementing EBPs. Figure 4 presents frequency of supports provided to teacher while implementing EBPs.

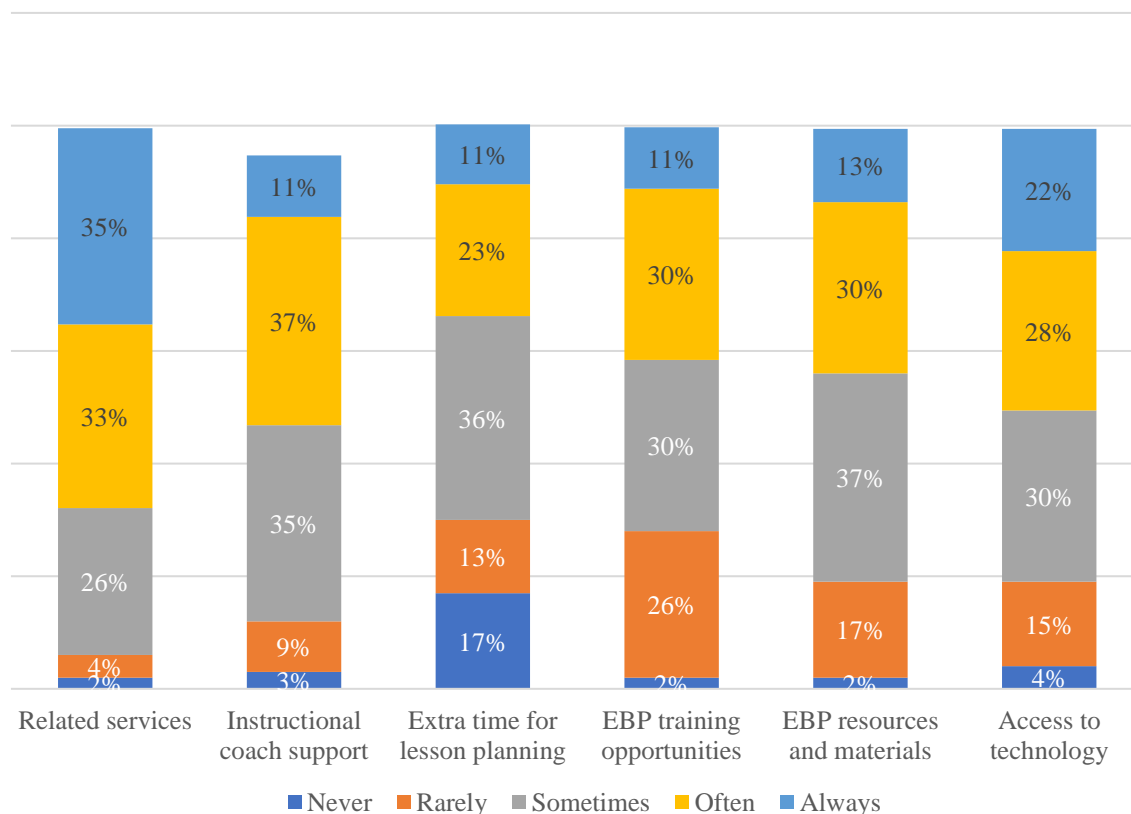


Figure 4. Frequency of Supports Received While Implementing EBPs.

### Qualitative Analysis

A deductive thematic approach was used to analyze the qualitative interview data. To maintain the confidentiality of the participants, they were assigned pseudonyms in order to reference them in this study. Their pseudonyms are as follows: Wanda (teacher 1), Tonya (teacher 2), Theresea (teacher 3), Francesca (teacher 4), Fatima (teacher 5), and Samantha (teacher 6). Because the interview questions were specifically constructed

to answer the research questions, the researcher developed a set of predetermined themes and then coded teachers' responses accordingly for later analysis. Multiple themes were identified for each research question throughout the six interviews. Based on the four research questions of the study, the themes identified include *experience, personal beliefs and previous training about EBPs, EBPs usage, overall perspective on EBPs, barriers to implementation of each EBP, and level of support.*

### **Research Question 1: ECE Teachers' Beliefs, Knowledge, and Training about EBPs**

To answer this question, the researcher identified three themes related to how the individual characteristics of teachers impact their perspectives regarding EBPs. These themes are *teachers' experiences, personal beliefs, and previous training.* Four sub-themes emerged out of their responses under the teachers' experiences theme, including two positive subthemes—*successes in the field* and *specific child's progress*, and two negative subthemes *student-teacher ratios* and *meeting a child's individual needs.* Three subthemes that emerged under the teachers' personal beliefs of teaching young children with ASD include *positive beliefs about inclusion, negative beliefs about inclusion, and teacher initiative.* The four subthemes that emerged under the predetermined theme of previous training on the use of EBPs are *pre-service training, out of district in-service training, district in-service training, and informal staff collaboration.* Finally, teachers' responses related to their *overall perspectives regarding EBPs* were also discussed as *positive or negative.* It is important to note here that because the researcher focused on responses that would provide important insights for answering the first research question, there were many instances noted in the table where there were zero comments related to a

subtheme. However, this provides important information as well, because it shows the overall tone of the interview when individual teachers spent their time answering the interview question with more of a focus on a positive versus a negative experience, belief, training, or overall perspective about EBPs (see Table 8).

Table 8

Themes, Subthemes, and Frequency of Teacher Comments

			Number of Teacher Comments					
			T1	T2	T3	T4	T5	T6
Themes	Subthemes							
Experiences	Successes	Successes in the field	4	6	1	3	3	1
		Specific child’s progress	1	1	3	2	2	1
	Challenges	Student-teacher ratios	1	2	0	0	0	0
		Meeting a child’s individual needs	4	3	3	1	1	1
Personal beliefs		Positive Belief about inclusion	1	0	0	1	1	1
		Negative Belief about Inclusion	0	1	1	0	0	0
		Teacher initiative	0	0	2	1	2	1
Previous training	Positive	Pre-service training	0	0	0	0	0	2
		Out of district in-service training	1	1	0	0	0	1
		District in-service training	0	1	0	0	1	0
		Informal Staff collaboration	0	0	1	1	0	0
	Negative	Pre-service training	0	2	2	2	1	0
		Out of district in-service training	0	0	0	0	0	0
		District in-service training	0	1	1	0	0	1
		Informal staff collaboration	0	0	0	0	0	0
Overall perspective		Positive perspective of EBPs	1	1	1	1	1	
		Negative perspective of EBPs	0	0	0	0	0	0

**Teachers' experiences.** The positive sub-themes that emerged under teachers' experiences are *successes in the field* and their *experiences with a child's progress*. Wanda, Tonya, and Francesca were the only three teachers who responded that their years of experience working in the field contributed to their knowledge of and ability to use EBPs effectively when working with young children with ASD. These teachers' years of experience ranged between 12 and 16 years. The other three teachers did not comment on their years of teaching experience as a contributing factor to their knowledge and use of EBPs. All six teachers also shared some classroom success stories that resulted from using a particular EBP or communication strategy with a young child with ASD in their classroom. For example, Francesca's face lit up each time she talked about a child in particular who learned how to communicate after she used *prompting* with gestures and simple sign language to teach him how to express his need to go to the bathroom:

Toward the end of the school year, we got him saying a couple of things and signing at the same time, so we were able to incorporate sign language, which was huge because in the very beginning we were having toileting problems. He wouldn't tell us when he needed to go or when he had some kind of a difficulty in the bathroom and stuff. He would just make these horrifying messes. It was like oh my gosh, I don't even know what to do with this. So, he was able to start communicating with us just those basic needs and everything and he blossomed.

They also shared how the collaborative efforts of the teachers, parents, and support staff contributed to the positive outcomes for these students. As another example, Fatima spoke of how at one time she had only 12 students in her inclusive classroom, and that the lower student-teacher ratio contributed greatly to the success of all her students. Francesca commented that just by being included in the classroom with her typical

learners, her student with ASD was able to learn from them and be successful, and they were able to understand that it's okay to be different.

The negative sub-themes that emerged from teachers accounts of their teaching experiences included *student-teacher ratios* and *meeting a child's individual needs*.

Wanda and Tonya focused on the struggles of not having enough help in the classroom to support the other students while working with the child with ASD on a specific skill.

These teachers reported their classrooms typically consisted of about 18 students with one assistant, and that even a student-teacher ratio of 9 to 1 is very high when a lot of special attention needs to be given to the child with ASD. All six teachers responded that one of the biggest challenges of working with a child with ASD in their inclusive classroom is being able to individualize interventions, particularly for those with extreme sensory needs, behavioral issues, and/or very low communication skills. Wanda's response sums up the general consensus of the interview participants regarding these challenges:

I think the challenge sometimes is if there's a behavior issue, where there's an extreme—like if a child has an extreme behavior and you have to give that child a lot of individual attention and then you don't have enough help in the classroom. Like here, there are 18 children and 2 teachers and if we have 18 children and 2 are autistic and 1 is having an extreme behavior and 1 is over there eating something they shouldn't and both teachers are with these 2 children individually, then there are 16 other children not being watched. So, that can become a challenge in itself, just the behavior. The second challenge I think is individualization of educational needs. Making my lesson plans have individual based goals for those children because I have goals for everyone of course. There's an overall goal for the class, but I need to make individual goals for those children based on their individual needs, so sometimes that becomes a challenge.

**Personal beliefs.** Sub-themes emerged as either *positive or negative personal beliefs about inclusion* and *teacher initiative*. As for personal beliefs, Wanda, Francesca, Fatima, and Samantha all had positive responses regarding the inclusion of children with ASD in ECE classrooms. Each of these four teachers highlighted the benefits for all students in the inclusive classroom setting. Tonya and Theresa, however, stated that it is not realistic to serve both the students with ASD and the typical students in the same classroom, especially when the child with ASD has severe needs and there are not enough supports. In addition to teachers' directly stated opinions on inclusion, the researcher also coded responses that indicated *teacher initiative* to seek out additional training and conduct personal research on EBPs. One of the possible reason's teachers may not use EBPs in their classrooms is that they lack confidence and/or trust in research (Sciuchetti, McKenna, & Flower, 2016). Furthermore, there have been a number of studies where teachers reported that they were more apt to rely on research literature when they believed an evidence based practice could be applied to their specific classroom teaching needs (Honig & Coburn, 2008; Nelson et al., 2009). Theresa, Francesca, Fatima and Samantha all said that they sought out EBP training on their own in order to improve their ability to effectively implement EBPs with young children with ASD in their classrooms. Thus, the researcher coded these responses under positive opinions about inclusion because their actions suggest that the teachers trust what the research literature says about the benefits of inclusion for most children with ASD when appropriate EBPs are implemented, and that they have accepted their responsibility as



educators to seek out and learn how to use these EBPs to ensure positive outcomes for these children.

**Previous training.** Fatima was the only teacher who reported a positive response regarding *pre-service training* and preparation for teaching children with ASD in ECE classrooms. Even then, she mentioned that she had received adequate training on only a few of the 13 EBPs. . Francesca stated that she received only minimal training in her undergraduate coursework. Tonya, Theresa, and Francesca stated that they did not receive any special education training as part of their early childhood teaching preparation program. Wanda did not mention her undergraduate program at all in her discussion of *pre-service training*, but she did speak highly of the support she received from her preservice program evaluator, who mentored her on EBPs during her first year of teaching, so the researcher coded that on the job coaching experience as *out-of-district in-service training*. Samantha also reported positive *out-of district in-service training* experiences through her graduate studies that she began once she started teaching. The other four teachers did not report any specific *out-of-district training* they had received on EBPs since they started teaching.

All six teachers reported some level of *district in-service training*, but only two of the teachers reported any significant benefit of those training experiences. One teacher reported that her center trained her for an entire week before she ever stepped into her classroom on how to use EBPs when working with young children with ASD. A second teacher reported that her center sent her to a number of beneficial trainings to learn about Social Skills, Exercise, and the PECS as effective EBPs to implement with young

children with ASD. On the contrary, a third teacher stated that her center offered in-service training, but they were not applicable for meeting the needs of children with ASD in her classroom, and the other three teachers reported they were not provided with in-service training at their center. Two teachers had very positive responses regarding the *informal teaching collaboration* they experienced when learning from colleagues and related service providers at their center. They spoke highly of these colleagues who showed them how to effectively use a particular EBP to support a child with ASD in their classroom.

**Overall perspectives regarding EBPs.** All six teachers responded that, generally speaking, EBPs are effective for working with young children with ASD, as long as you have the training and know-how to implement them. Tonya explained:

You've got to have the whole package. It's not—it's really not one of them. I can't name one [EBP] that [always] works better than the other ones. Anything is really worth a try. You've got to be open to any avenue. Those evidence-based practices, they're good to know. You have to have those in your mind. You have to have those trainings.

Theresa explained how important it was to have specialists and special education staff to support and train her to use specific EBPs, because she was not trained on the use of EBPs in her early childhood teaching preparation program. She said that without the help of these colleagues, she wouldn't have known any of what she now knows about using EBPs to help children with ASD in her classroom:

I don't think you can rule any [EBP] out. These kids are so their own person and they're all so unique. I don't think you could say any [EBPs] won't work with any of them. I think just trying to find out what works for each individual kid. They're

all so different. If you're not trained in [EBPs], you're limited by the IEP team really. So, if the speech therapist and the other specialists don't know [about an EBP] either, we [ECE teachers] certainly don't know.

### **Research Question 2: Perceived Effectiveness of EBPs**

The quantitative data alone would reveal to the researcher which EBPs were most rated as highly effective by the survey participants. However, the researcher also wanted to know if teachers' use of a given EBP was impacted by their perception of its effectiveness. In other words, are the EBPs teachers deem *most effective* the ones they also use most frequently in their classrooms? To better understand this phenomenon, the researcher asked interview participants to talk about the EBPs they found most effective for improving the functional communication skills of young children with ASD, and why. The researcher then coded their responses, using the predetermined theme of *EPB usage*, for both effectiveness and frequency. A given EBP was coded *most effective* only if a teacher specifically named it first or second in her response to EBPs she found to be most effective in her classroom. Any EBPs named after the first two, or not named at all, were not coded as such. Furthermore, EBPs never mentioned by a teacher in the interviews received a frequency code of *never used*. Table 9 reflects the results of the interview responses for each teacher's EBP usage.

Table 9

## EBP Usage

	T1	T2	T3	T4	T5	T6
PECS	NV	ST	NV	NV	NV	ST
Modeling	<b>FQ</b>	<b>FQ</b>	NV	FQ	<b>FQ</b>	<b>FQ</b>
Differential reinforcement	FQ	FQ	FQ	FQ	NV	ST
Social skills	FQ	FQ	ST	<b>FQ</b>	FQ	FQ
PMI	FQ	SD	SD	FQ	ST	FQ
Video modeling	NV	FQ	NV	NV	SD	NV
PRT	NV	NV	NV	NV	SD	NV
Reinforcement	FQ	FQ	FQ	FQ	FQ	<b>FQ</b>
Naturalistic intervention	FQ	NV	NV	FQ	ST	FQ
Prompting	<b>FQ</b>	FQ	<b>FQ</b>	<b>FQ</b>	FQ	FQ
FCT	NV	NV	NV	ST	NV	NV
Exercise	FQ	<b>FQ</b>	<b>FQ</b>	FQ	FQ	NV
Discrete trial teaching	NV	NV	NV	SD	SD	NV

Note. FQ=Frequently, ST=Sometimes, SD=Seldom, NV=Never; Never=reported by teacher as never used or it was never mentioned; Bolded=reported by teacher as one of the two most effective EBPs she had used; PECS=Picture Exchange Communication System; PMI=Peer-Mediated Instruction; PRT=Pivotal Response Training; NI=Naturalistic Intervention; FCT=Functional Communication Training. T1=Wanda, T2=Tonya, T3=Theresa, T4=Francesca, T5=Fatima, T6=Samantha

**EBP usage.** The EBPs reported as *most effective* by the interviewees were modeling (four teachers), prompting (four teachers), social skills (two teachers), reinforcement (one teacher), and exercise (one teacher). One of the most touted EBPs was modeling. Wanda explained:

We're constantly modeling and we're constantly talking—I call it narration, but there's a fancy word for it, but I'm talking about what I'm doing. Watch me. I'm going to turn the water on. I'm gonna pump the soap one time. I'm gonna scrub

my hands all around, you know. I'm modeling constantly with my words and my actions. And then the children learn this from me and then they do it too . . . I really think that modeling is the best all the time. That's what I do all the time. I talk it, I do it, I show it, live it. That's me, all day.

The majority of teachers also spoke very highly of prompting because of its ease with implementing in the natural environment and with the entire class. For example, Francesca explains her use prompting to help a child in her classroom with functional communication delays that seamlessly applies to her whole class: "Prompting, absolutely. It seems I do that with everybody. All my kids get prompted". As for frequency, all six teachers reported *frequently* using prompting and reinforcement. Five teachers also reported *frequently* using social skill, but Theresa reported only using it *sometimes* because she was not formally trained to use it and the speech therapist taught her how to implement it with a particular child who had limited functional communication skills:

I kind of go with the IEP team to help me work out where we need to be. Frankly, the child I have this year has a really good speech therapist and she is the one that asked for augmentative communication testing. So, we went through all of that and that's where we started with [social skills]—we had somebody come in and do an assessment and tell us what she thought would be the best course of action to help her communicate . . . but I wouldn't have known how to even start this if it weren't for the speech therapist wanting to go through with this testing.

Exercise was also mentioned by five teachers as *frequently* used, but Samantha responded that she had *never* used it as an EBP. She explained that although she does have her students do yoga, run laps, and take brain breaks, she was not trained on how to implement *exercise* as an EBP, so she can't say for sure that the way she does it in the classroom is the EBP. Modeling was also discussed as a *frequently* used practice by five

teachers, but one teacher, Theresa, never mentioned modeling during the interview discussion of EBPs she had used.

Differential reinforcement was reported as a *frequently* used EBP by four of the six teachers. Fatima did not mention using the practice at all, and Samantha reported using it only sometimes. Both naturalistic intervention and PMI were only reported by Wanda, Francesca, and Samantha as an EBP they *frequently* implement in their inclusion classrooms. As for the three teachers who did not report using naturalistic intervention or PMI frequently, Fatima reported using naturalistic intervention only *sometimes*, and the other two, Tonya and Theresa, did not mention it at all. As for PMI, Fatima mentioned using it *sometimes* depending on the needs of the child she was working with, and Tonya and Theresa stated they *seldom* use the practice. Video modeling was only reported by Tonya as an effective EPB that she uses *frequently* in her classroom. Theresa stated she had *never* used it, Fatima reported that she *seldom* used it because of time constraints. The other teachers did not mention using video modeling at all. PECS was only mentioned by Tonya and Samantha as an effective EBP, and both reported only using it *sometimes* when working with young children with ASD in their classrooms. Theresa stated that she had *never* used it because she was not trained to use it and it was not provided by her school. The other three teachers did not mention PECS at all.

Overall, DTT, FCT, and PRT were reported as the least used practices in the inclusive classroom. Four of the six teachers responded that they *never* use DTT. Of those four, Samantha stated that she had *never* used it because she had never heard of it before and Wanda, Tonya, and Theresa each responded that DTT is just not practical for

working with young children with ASD in inclusive classrooms because it requires one-to-one teaching. Wanda's explanation sums up the general feeling of these teachers about DTT:

If I had more staff and I could do more one-on-one, that would probably be incredibly helpful, but honestly, I think in any pre-K program that you go into, you're gonna find the same thing. There's just not enough teacher/child ratio for that to be implemented. It's just not possible. I think you will notice that if you go into the classroom. There's gonna always be about the same that I said, 2 to 19, sometimes 2 to 20. I actually have kind of a small class, 2 to 18, because in other classes there are 20 kids. That's a big deal. If we had more people, yes, I'd have more time to do one-on-one individualized teaching, but I just don't have it. I just can't. It's not that I don't want to. It's just not possible in this setting.

The other Francesca and Fatima both reported that they *seldom* use DTT.

Francesca stated she found it too difficult to work one-on-one with one child in an inclusive classroom while meeting other students' needs, and the Fatima reported she felt she needed more training to be able to implement it effectively. FCT was only mentioned by Francesca as an intervention they had used only sometimes in the past to address the specific communication delays of a child with whom they were working. Wanda, Tonya, Theresa, and Fatima did not mention the practice at all during the interview, and Samantha stated that she had never heard of it. PRT was also not mentioned by five of the six teachers as an EBP they had used in their classrooms. Fatima reported using PRT, but she stated that she *seldom* did so because she didn't find it effective for young children and because she lacked the necessary training to implement it.

It is important to note here that there were three EBPs that interviewees discussed that led the researcher to question whether they had a true understanding of the EBP and

how to implement it. These EBPs included PECS, social skills, and exercise. Two of the six participants interviewed (33%) spoke of using PECS when they were clearly only using a picture book or visual cue strategy instead. Although it may be a far-reaching assumption, this could potentially explain why there was a low number of survey responses rating PECS as “very effective,” depending on how many of the 65 teachers altogether also held misconceptions about PECS and how to implement it with fidelity. As another example, three of the six teachers (50%) responded that they had used the social skills EBP, but then gave details that suggested they were talking about social narratives, a different EBP not included in this study, when asked about their use of this EBP. Lastly, it was apparent from the interview conversations with two teachers that their understanding of exercise was simply allowing the students time to be active.

### **Research Question 3: Challenges Encountered When Implementing EBPs**

To answer the research question regarding the challenge’s teachers’ experience when using EBPs with young children with ASD in their classrooms, the researcher identified the following sub-themes: *lack of training and/or support, lack of time, high student-teacher ratio, lack of space and lack of materials/equipment.*

**Barriers to implementation of EBPs.** All six teachers reported a *lack of training and/or support* as a major barrier to implement one or more of the 13 EBPs in their classrooms. For example, when asked if she thought this is one of the challenges to implementing some of the EBPs on the list, Samantha replied:

It could be, yes, because some of [the EBPs] I have not heard of before. Of course, being in grad school, I have a better knowledge of where to find information about those and how to try them, but if you don’t have those



resources, then yes, you would not even have—you'd have no idea. As a gen. ed. teacher, you wouldn't know to go look at this and this and this or the websites I do, cause you have not experienced that and you have no clue as to what to do with [the students with autism] other than what you think you know. Our county doesn't offer training . . . there are behavior workshops, but it doesn't always cover autism or specifically those [EBPs].

All six teachers also reported a *lack of time* to plan and implement EBPs for a child with ASD while also planning and teaching the general curriculum and attending to the needs of the other children in the class. Specifically, time was reported as a barrier to discrete trial teaching and video modeling, as well as a barrier to implementing EBPs in general. Wanda, Tonya, and Samantha also responded that a *high student-teacher ratio* is a barrier to implementing EBPs, particularly for those children with severe needs who require one-on-one attention. Tonya explained:

One of the bigger challenges that we have is a large ratio, like I said 18 to 2 teachers. Sometimes those children could really benefit from more one-on-one. In those cases where I can't be right with them all the time, there could be some years where I have 4 or 5 children out of 18 that have extreme behaviors and/or sensory needs that I can't provide for them one-on-one because I'm kind of juggling. I also need to be there for the other children. So, you also have things where you could have children that have never been around other children before and now, they're thrown into a classroom of 18 and they're also with a child that screams all day or has tantrums or is having a difficult time getting acclimated. That would scare the other child. You have that a lot.

Tonya and Theresa both reported a *lack of space* within the classroom to work with an individual child away from the other children. For example, Theresa responded that her room was just not big enough to accommodate the extra support staff, furniture, centers and the materials needed to implement some EBPs. Theresa and Fatima also commented that although they would like to be able to implement certain EBPs, like

video modeling or PECS, they are unable to due to *lack of materials/equipment* provided by their center.

#### **Research Question 4: Levels of Support Provided to Teachers While Implementing EBPs**

To determine how the level of support available to a teacher impacts his/her reported barriers to implementing EBPs, the researcher identified six levels of support from teachers' responses. These include *administrative support of teacher autonomy, related services, collaborative teaching staff, mentor/coach, community partners* and *IEP team*. Table 10 reflects the level of support teachers reported in each of these areas.

Table 10

#### Level of Support

Level of Support	T1	T2	T3	T4	T5	T6
Administrative support	HL	SL	SL	SL	HL	NN
On-site appointed mentor/coach	NN	NN	NN	NN	NN	NN
Outside Resource/Community Partner	HL	HL	NN	NN	SL	NN
Related service providers	SL	HL	LL	HL	HL	HL
IEP/EC team	NN	NN	HL	HL	HL	HL
Collaborative teaching staff	HL	LL	LL	HL	HL	SL

*Note.* HL = high, SL=substantial, LL = limited, NN = none provided/not mentioned

**Level of support.** Wanda and Fatima both reported a high level of *administrative support of teacher autonomy* to make decisions about which EBPs to implement. Wanda, Tonya, and Fatima reported receiving at least a *substantial* if not a high level of support from outside resources, including *community partners*, contracted *related service*

*providers*, and a *mentor/coach* as part of a licensing program. Wanda spoke at length about the support she received from the teacher preparation program mentor who coached her during her first year of teaching:

I think the biggest type of support that I've gotten honestly was from my mentor for the licensing program. Not actually from my job . . . I have to be evaluated by someone who comes in and observes me and scores me, you know, and pretty much tells me how I'm doing and ways I can improve and things I can change. They're all based on these evidence-based practices and also on the teaching standards. . . . She would ask me questions. Like why do you guys do it like this? Sometimes I will say I don't know. That's just the way it's always—that's how I learned how to do it. Then she said well, does it work the way that you do it? I was like well sometimes or yes or no. Then she'd say when you ask yourself this question, why, why do you do that as a teacher, if the answer is not a good one, then do you need to self-reflect and re-evaluate another way to do it that would be more effective? Then just the way that she said these things to me made me be a better teacher, made me become more self-aware of what I was doing and how I was teaching.

Wanda, Francesca, and Fatima also reported receiving a *high level* of support from in-school colleagues such as a *collaborative teaching staff*, although two teachers reported that support from other teaching staff members was limited. Five teachers also reported a substantial or *high level* of support from their in-school *related service providers*, such as counselors, psychologists, therapists, communication specialists and speech-language pathologists. When explaining who she goes to for support within her center, Samantha stated, “The resource people, speech, OTP, physical therapy. If you ask them, hey, this is what's happening. What are your thoughts? They have great ideas. Theresa, however, reported *limited* support from the related service providers within her school, stating they are not trained to work with young children with ASD. Four teachers

also reported that they receive a high level of support from the IEP/Exceptional Children's team at their site. These include Theresa, Francesca, Fatima, and Samantha.

## **CHAPTER V**

### **DISCUSSION**

The purpose of the present study was to examine early childhood education (ECE) teachers' perceptions and experiences using evidence-based practices (EBPs) to improve the functional communication skills of young children in inclusive settings using a mixed methods convergent parallel design. While there has been substantial research evidence to support the use of EBPs to improve the outcomes of young children with ASD spectrum disorder (ASD), many ECE teachers continue to report that they struggle to implement these practices (Brock & Winterbottom, 2018; Cooper et al., 2018; Guralnick & Bruder, 2016; Wong et al., 2015). There has been much attention in the research literature to understand this EBP research to practice gap in general; however, there has been no research to our knowledge with a primary focus on the perspectives of ECE teachers with regard to the effectiveness of EBPs to support the communication needs of young children with ASD in inclusive settings.

The purpose of this chapter is to summarize and interpret key study findings of the present study and discuss the study findings in relation to previous research. Implications for practice and research is followed by the limitations of the study. The chapter concludes with a final summary of the research.

## **Key Findings**

The key findings are organized according to the themes that were developed to analyze the data and answer each of the four research questions. The key findings to be discussed in this section include teachers' knowledge, experiences, and beliefs about EBPs, perceived effectiveness of EBPs, and the challenges to and supports for implementing these practices.

### **Teachers' Knowledge, Experiences, and Beliefs about EBPs**

“Constructivism is an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner” (Elliott, Kratochwill, Littlefield Cook, & Travers, 2000, p. 256). Teachers' beliefs, formed from their prior knowledge and experiences, have been shown to have an effect on their use of teaching strategies (Hashweh, 1996; Shelton, 2013), their approaches to problem-solving (Kozleski et al., 2015; Sailor et al., 2015), and their ability to make adaptations when necessary to meet the needs of their learners (Armstrong, 2019; Barned et al., 2011).

The results of the study revealed a strong relationship between teachers' personal beliefs about the effectiveness of EBPs and their knowledge of EBPs. Although the inclusive education of young children with disabilities has been proven by research to be a best practice (DEC & NAEYC, 2009; DEC, 2014), many ECE educators continue to report being unprepared to successfully meet these children's unique needs (Brock & Beaman-Diglia, 2018; Howley, Faiella, Kroeger, & Hansen, 2020; Maiorca-Nunez, 2017). According to a 2019 study on the beliefs and attitudes of ECE teachers working in

inclusive classrooms, few had sound knowledge of special education or the skills to teach their young children with disabilities (Parey, 2019). The results from the current study revealed that nearly three-fourths of the teachers surveyed reported being adequately prepared by their ECE teacher preparation programs to implement EBPs with young children with disabilities in inclusive classrooms. This is an important finding, considering the strong correlation between teachers' pre-service training and their beliefs about the necessity of using EBPs when working with young children with ASD. This finding adds to the current literature in that teachers who believe they were well prepared to implement EBPs by their preservice programs also held positive attitudes about the importance of using them (Cooper et al., 2018). This is especially promising given that each year increasing numbers of young children with ASD are receiving educational and developmental services within inclusive ECE settings (Brodzeller et al., 2018).

In this study, strong correlations were also observed between in-service training and teachers' beliefs about the necessity, ease of implementation, and helpfulness of EBPs. More than half of the teachers who completed the survey reported that they received ongoing training and professional development through their employers to learn about the implementation of EBPs while working with young children with ASD in inclusion classrooms. When asked to elaborate on their in-service training during the interview, most teachers spoke of the informal training they had received from their colleagues, specifically from the special education teachers or related service providers who provided services to children with disabilities in their classrooms. This finding may indicate that when teachers reported receiving in-service training on the survey, they may

have been referring to formal professional development as well as informal training on EBPs. This result is not surprising, since prior studies have shown that interpersonal relationships with colleagues are an important aspect of a teachers' sense of success and self-efficacy (Garwood, Werts, Varghese, & Gosey, 2018). This is also supported by the premise of constructivist learning theories, which emphasize that learners gain knowledge from active learning environments where they collaborate and engage in critical thinking, discovery and active problem-solving to arrive at a solution (Howard, McGee, Schwartz, & Purcell, 2000).

The present study revealed a positive association between teachers' beliefs about EBPs and their self-learning/training through the review of current research findings about EBPs to teach young children with ASD. Constructivist Learning Theory suggests that learners, in this case teachers, learn best by trying to make sense of something on their own with the help of an expert on the topic to guide them along the way. Prior research has shown that teachers are more likely to understand the importance of using EBPs to improve learner outcomes when they have ample access to research that they trust and have confidence in (Boardman, Arguelles, Vaughn, Hughes, & Klinger, 2005; Sciuchetti et al., 2016). In this study, most teachers reported receiving a high level of support from their own use of technology to research and learn about best practices for teaching young children with ASD. Almost half of the survey respondents reported that they keep up with literature findings to learn about EBPs. Moreover, three-fourths of the teachers reported receiving a high level of support from their own use of technology to research and learn about best practices for teaching their students with autism. This



suggests that the high number of teachers' selection of technology as a support for implementing EBPs in their ECE inclusive classrooms may have also been their way of reporting teacher initiative to train themselves on the job about EBPs by reading up on online research articles. This study adds to existing research findings that teachers hold more positive beliefs about EBPs when they keep up with the current research findings about EBPs (Gapsis, 2017; Guckert, Mastropieri, & Scruggs, 2016; Hornby, 2014).

### **Perceived Effectiveness of EBPs**

More than half of the teachers in this study reported adequate to extensive knowledge of modeling, prompting, social skills, PECS, reinforcement, exercise, differential reinforcement, peer-mediated instruction, and video modeling. Multi-component and more comprehensive intervention practices such as functional communication training, naturalistic intervention, discrete trial teaching, and pivotal response training were less known by the participating teachers. When the data on teachers' use of these EBPs was investigated, it was found that there was no single EBP that all teachers reported having used in their inclusive ECE classrooms to address the communication needs of a children with ASD. Teachers reported the use of several EBPs more often others. These included modeling, social skills, prompting, reinforcement, PECS, exercise, and differential reinforcement. As in knowledge, discrete trial teaching, pivotal response training, naturalistic instruction, video modeling, and functional communication training were among the least used EBPs by participating teachers.

There are at least four important points to note with respect to teachers' reported knowledge and use of EBPs. First, modeling, social skills, prompting, reinforcement,

PECS, exercise, and differential reinforcement were among the most frequently used practices by ECE teachers within the context of inclusive classrooms while working with children with ASD. This was an expected finding, since the nature of these EBPs, with the exception of PECS, allow for group or whole class implementation and do not require many structured steps and procedures as in the other multi-component practices such as pivotal response training and functional communication training.

Second, although ECE teachers reported knowledge and use of several naturalistic strategies including modeling and prompting, it was somewhat surprising to see that many teachers reported very weak knowledge and use of naturalistic instruction. Naturalistic instruction is a recommended practice in early childhood special education (DEC, 2020) and many teachers' preparation programs focus on naturalistic instruction to support practices in natural and inclusive settings (Coogle, Ottley, Rahn, & Storie, 2018; Snyder et al., 2015). Furthermore, it has been proven in the research to be one of the most appropriate interventions to use in inclusive classrooms. Research shows that embedding learning opportunities for these children within the context of naturalistic everyday classroom activities and routines has been associated with increases in both child engagement and acquisition of new skills (Rakap, 2017, 2019; Snyder et al., 2015). One explanation for this finding could be related to the emphasis placed on the use of EBPs in teacher preparation programs in recent years. For example, it was in 2015 when the Initial Preparation Standards developed by the Council for Exceptional Children (CEC) emphasized that new teachers need to be able to select, adapt, and use EBPs to support development and learning of children with disabilities (CEC, 2015). Since the average

number of teachers who participated in this study had 10 years of experience, it is possible that they did not receive the same level of preservice learning on EBPs ten years ago that newer teachers experienced in their preparation programs. This may also suggest that preservice programs have improved over the past decade as a result of greater attention to EBPs such as naturalistic intervention when preparing teachers for the classroom.

Third, ECE teachers reported less knowledge and infrequent use of several EBPs including discrete trial training, pivotal response training, and functional communication training. These EBPs are multi-component, more comprehensive, and intensive in nature in comparison to other practices such as modeling and prompting. Modeling, prompting, or reinforcement are often used as part of these more comprehensive practices. Furthermore, some of these practices (e.g., discrete trial teaching or pivotal response training) often require one to one teaching with the child and involve a structured protocol to be followed which might further limit teachers' use within the busy context of ECE classrooms. Research has shown that ECE teachers rarely use multi-component or comprehensive practices without training and implementation support (e.g., coaching) (Hemmeter, Snyder, & Fox, 2018; Rakap, Balikci, Kalkan, & Aydin, 2018; Snyder et al., 2018). Fourth, although teachers reported adequate level of knowledge for video modeling, they also reported infrequent use of this practice. This could be explained by the fact that video modeling practice requires extensive work and planning prior to implementation. ECE teachers often report not having sufficient time for planning and

implementing focused interventions for children with disabilities when also meeting the needs of other children in their classrooms (Kaitlyn & Rebecca, 2019).

With respect to perceived effectiveness of EBPs teachers reported using, all strategies except PECS were reported to be very effective by more than half of the participating teachers. Moreover, at least 70% of ECE teachers reported that discrete trial teaching, exercise, social skills, prompting, modeling, functional communication training, and reinforcement were very effective. These findings are in line of the findings of other studies reporting effectiveness of these practices using experimental research designs (NAC, 2015; AFIRM, 2020). However, it must be noted that some of the most effective practices (e.g., discrete trial teaching and functional communication training) were used less often due to lack of training, resources, or high student-teacher ratio in the classroom.

There are two distinct philosophical categories of teaching and learning: traditional and constructivist (Chan & Elliott, 2004; Chan, Tan, & Khoo, 2007; Eren, 2009). Traditional views of teaching and learning posited that knowledge can be simply transferred from the teacher to the learner (Dewey, 1897). This idea would suggest that once teachers learn about EBPs in their preparation programs, that knowledge should be transferred from their instructor to their minds, and therefore they should know how to implement those EBPs. However, the constructivist teaching and learning theory asserts that until the learner learns by *doing*, not just passively taking in information, that knowledge will not move from the external to an internal understanding of that skill (Duffy & Jonassen, 1992). And for Vygotsky, this also includes a social component of

taking in information, “first, through interaction with others, and then integrated into the individual’s mental structure” (Vygotsky, 1978, p. 57).

Findings of this study revealed that the majority of teachers understand the necessity of using EPBs when working with young children with ASD in the inclusive ECE classrooms and that each of the 13 EBPs could potentially be very effective for addressing the communication skills of young children with ASD, as long as adequate training and support are available to learn and understand how to select and implement the most appropriate EBP to meet the individual needs of children in their classrooms. All six teachers who participated in the interviews reported positive classroom experiences from using a particular EBP to help young children with ASD to communicate their wants and needs. This finding suggests that teachers’ classroom experiences, not years of experience, is what most impacted their perspectives on EBPs. When teachers used the information, they gathered from their training and research of the literature to implement the EBPs in their classrooms, and then witnessed the success of young learners in their classrooms, they formed positive perspectives about the effectiveness of those EBPs. This finding is supported by the constructivist premise that learning develops through “authentic” tasks (Vukelich, Enz, Roskos, & Kristie, 2019), not strictly from a passive transfer of information obtained from preservice reading, research, or instruction on how to select and use EBPs.

One concerning finding of the present study was that even though teachers agreed that EBPs are effective interventions for teaching young children with ASD in inclusive ECE classrooms, not all teachers who participated in the interviews agreed that all

children with ASD should be included in ECE classrooms. One teacher argued that it is not realistic to expect ECE teachers to be able to serve young children with ASD with severe needs in their inclusive ECE classrooms because these children require “too much” individualized attention and teachers have other children in their classrooms that they must also teach and attend to. This finding adds to the current body of research findings that although ECE teachers may support inclusion, they have mixed feelings about including children with severe disabilities in their own inclusive classrooms (Cameron & Cook, 2013; R. L. Koegel & Oliver, 2019; Rakap, Cig, & Parlak-Rakap, 2017; Shelton, 2013).

### **Challenges to and Supports for Implementing EBPs**

This study revealed *training*, *resources*, and *time* were the most reported barriers to and the least reported supports for effectively implementing EBPs in inclusive ECE classrooms. All six teachers who participated in the interviews indicated that the biggest barriers to EBP implementation were these same three factors. This finding suggests the necessity of all these supports to be in place for ease of selecting and using EBPs, and that the absence of any one of these classrooms supports poses a barrier to their implementation. Findings of this study are in line with findings of many other studies reporting several environmental barriers (e.g., lack of training, resources, and time to effectively plan and implement EBPs in the classroom) for successful implementation of inclusive and EBPs (Brock & Winterbottom, 2018; Hornby, Gable, & Evans, 2013; Odom, Cox, & Brock, 2013).

The supports most reported in the study were (a) related services personnel, (b) technology, and (c) instructional coaching support. Teachers in this study expressed a strong appreciation for the support they receive from their students' related services providers. It is important to note here that the presence of a related service provider in the classroom also results in a decrease in the student-teacher ratio during that time, which was commonly reported as a barrier. Moreover, the finding in relation to instructional coaching support is important to note as the recent research evidence has shown that teachers often need in-class implementation support (e.g., practice-based coaching) following a training to implement compressive practices (Hemmeter et al., 2018; Hemmeter, Snyder, Fox, & Algina, 2016). The findings also indicated that teachers often rely on online resources to learn about and implement EBPs. Teachers used technology when conducting their own research to find ways to help young children with ASD in their classrooms.

### **Implications for Practice and Research**

This study helps to fill an important gap in the research literature regarding teachers' perspectives on the effectiveness of EBPs to support the functional communication needs of young children with ASD in inclusive classroom settings. Teachers' reflections and discussions about their experiences and successes with implementation is also theoretical evidence of how constructivist learning takes place. The constructivist theory emphasizes that learning happens when learners (e.g., teachers) use active techniques such as experimenting and real-world problem solving to create

new knowledge on top of prior knowledge about a phenomena (e.g., EBPs), and then reflect on and talk about what they did and what they learned from their experiences.

Overall, ECE teachers working in inclusive classrooms shared positive attitudes about the 13 EBPs explored in this study and felt that even the ones they had not used or heard of could potentially be effective interventions for working with young children with ASD who have limited functional communication skills. Teachers also indicated that although they used some EPBs more frequently than others, they recognized the importance and benefit of having multiple EBPs to choose from in order to be able to select the most appropriate intervention for a given learner's individualized needs.

The most frequently used EBPs by the ECE teachers were modeling, social skills, prompting, reinforcement, PECS, exercise, and differential reinforcement. However, as many as one half to one third of the teachers reported that they had never implemented even these most commonly used EBPs in their classrooms, which suggests that there have been many lost opportunities for young children with ASD to develop to their fullest potential.

Findings with respect to low levels of pre- and in-service trainings focused on EBPs is a concerning, since all public and many private preschool programs in North Carolina require ECE teachers to hold a state issued birth-kindergarten (BK) teacher license. Moreover, North Carolina's BK teacher preparation programs include courses specifically aimed at preparing ECE teachers to teach both children with developmental delays as well as typically developing children in high quality inclusive classroom



settings. These findings warrant further investigation of the curriculum implemented in the preservice teacher preparation programs in relation to EBPs.

Teachers continue to believe they are not adequately prepared by their preparation programs to implement EBPs. Teacher preparation programs should include more extensive, authentic, hands-on training with respect to EBPs in the context of courses, practicum and field experiences to ensure new teachers enter the field prepared to select and implement EBPs in inclusive ECE classrooms. Being able to do this is a critical skill every ECE teacher must have in order to ensure equitable outcomes for all the children they teach, including children with ASD. Other recent research findings also show that teachers want and need more hands-on learning opportunities in their initial teacher preparation programs for working with children with disabilities (Murray, 2019). High-quality teacher preparation programs are critical to fully prepare teachers to meet the needs of all children, including those with special needs. Findings of this study may encourage ECE teacher preparation programs to reevaluate their curriculum to determine if the courses offered are adequately preparing new teachers for the growing demands of today's inclusive classrooms. For example, not all BK teacher preparation programs in North Carolina uniformly offer a course that focuses specifically on teaching children with ASD and the implementation of EBPs to improve outcomes for these children. Requiring the inclusion of one or more courses focused on the use of EBPs to teach learners with ASD in all teacher preparation programs across the state would greatly improve the BK program. Furthermore, a specific focus on particular EBPs, such as those that involve naturalistic instructional approaches that can be easily and effectively

implemented in the inclusive classroom, should be considered. Thus, a recommendation for future research is to compare the curriculum implemented in ECE teacher preparation programs compared to special education teacher preparation programs, specifically with regard to courses that focus on ASD and the active implementation of EBPs. Surveys and interviews of first year teachers' beliefs about their preparedness and self-efficacy to select and implement EBPs with young children with ASD in inclusive ECE classrooms would also provide important insights. Findings of such research could help teacher preparation programs to review and revise their curriculum to better prepare teachers to work with young children with ASD. Several other studies have also called for the higher education institutions to reevaluate their teacher preparation programs to ensure they adequately prepare general education teachers to work with children with ASD in inclusive classrooms (Hart & Malian, 2013; Hauber, Mehta, & Combes, 2015; Hsiao & Sorensen Petersen, 2019).

A concerning finding of the present study was that some teachers felt that children with ASD should not be educated in inclusive ECE classrooms when they have severe needs. This perspective goes against a robust body of research literature that supports the benefits of inclusion for children with and without disabilities across a variety of developmental domains (Murray, 2019). Furthermore, federal regulations mandate that states ensure young children ages 3 to 5 years are provided educational services in the least restrictive environment (LRE), which may include regular public or private preschool programs (IDEA, 2016). Findings of this study may suggest that teachers who oppose inclusion may not fully understand the laws regarding the rights of children with

disabilities and their responsibilities as teachers to ensure these children receive equitable opportunities to learn alongside typical peers in the ECE classrooms. Recent studies show that teachers continue to enter classrooms misinformed about special education laws, and in turn may inadvertently violate the legal rights of their students with disabilities (Agran et al. 2020; O'Connor, Yasik, & Horner, 2016). Therefore, teacher preparation programs should ensure that all ECE teacher candidates graduate from the program with a full understanding of the principles of the LRE, the civil rights of young children with disabilities, prior research on inclusion, as well as the major policies and laws regarding inclusive education (Bruner & Bartlett, 2008; Holdheide & Reschly, 2008; Imber, 2008; Littleton, 2008; Schimmel & Militello, 2007).

Talib and Paulson (2015) suggest that although many teachers may know what EBPs are, they do not feel adequately trained and supported to implement them with young children with ASD. Teachers' responses regarding the lack of in-service training and support they receive to implement EBPs offers important implications to ECE administrators on how they can better support their teachers and provide better training opportunities on the use of EBPs for their young learners with ASD (Knight, Huber, Kuntz, Carter, & Juarez, 2018). Fortunately, teachers in the current study reported that they often take their own measures to seek out training and resources focused on EBPs. This suggests that many teachers do recognize the benefits of EBPs, understand the laws and mandates regarding their students with disabilities, and are therefore implementing the EBPs they have learned about, when they can. However, implications for the provision of more extensive in-service training and professional development on EBPs,

as well as the provision of formal, ongoing professional development, time for planning, and ample resources and materials are also necessary to ensure ECE teachers are both prepared and supported to teach young children with ASD who may be included in their classrooms.

Brock and Carter (2017) emphasize the need for schools to create an ongoing system of support and training, including coaching and feedback, for teachers to learn about EBPs and how to effectively implement them to improve the outcomes for children with ASD. Moreover, a combination of improved ECE teacher preparation, as well as ongoing in-service professional development and coaching, would provide teachers with the knowledge, resources, and supports they need to effectively support the needs of young children with ASD (DeAngelis, Wall, & Che, 2013; Hsiao & Sorensen Petersen, 2019; Knight et al., 2018; Talib & Paulson, 2015).

Another recommendation for future practice is for administrators to adopt more collaborative methods to support professional development of teachers so that new teachers to the field do not feel isolated and helpless when trying to problem solve when meeting the needs of children with ASD. When ECE teachers know they have colleagues, coaches, and instructional supports in place to help them do what is best for their students, they have a higher sense of self efficacy and their students, as a result, have higher chances for improved outcomes (Garrity, Longstreth, Salcedo-Potter, & Staub, 2016; Hsiao & Sorenson Petersen, 2019; Knight et al., 2018).

Understanding how collaboration, training, and support for new teachers in the field should be implemented in schools is an important implication for future research

(Lindsay, Proulx, Scott, & Thomson, 2014; Reed, Osborne, & Waddington, 2012). Future studies should focus on determining how and when and in what format administrators should provide teachers with the training, collaborative support and any other resources they may need to effectively implement EBPs for their learners with ASD within inclusive classroom settings.

The results from this study provide a foundation for understanding associations between teachers' individual characteristics (training and teaching experiences) and perspectives on the effectiveness of EBPs for improving the functional communication skills of young children with ASD in inclusive ECE classrooms. Future research can extend this work further in several directions. First, this study relies on teacher reports. Follow-up observational and experimental studies might be appropriate for examining relationships between teachers' reported knowledge of EBPs and their ability to implement them with fidelity. Second, this study should be replicated with a relatively large group of teachers to support generalization of study findings. Third, future research could also examine the relationship between teachers' implementation of EBPs and their impact on child learning outcomes and compare the findings with teachers' self-report on the effectiveness of EBPs.

### **Limitations**

The current study had a number of limitations that should be considered when interpreting the findings. First, there was a limited number of ECE teachers who met the participation criteria for this study, which limits the generalization of the survey results to samples with similar characteristics. This limitation is in part due to the fact that only

four and five stars childcare program directors were contacted to recruit ECE teachers. Although this method increased the likelihood of finding certified teachers at highly rated centers, it overlooked participants at centers with lower ratings who may have also met the criteria for participation in the study. The limited sample size of 65 teachers also prevented inferential analyses of the variables. As a result, the examination of the associations among the variables was also limited. Nevertheless, the results from the descriptive analyses provide a foundation for understanding the associations between ECE teacher's perspectives on EBPs and their training and experiences with teaching young children with ASD in inclusive classrooms.

Another limitation of this study was the small number of ECE teachers who participated in the one-to-one interviews. The recruitment process was designed to focus on ECE teachers who had actual classroom experience using EBPs to meet the communication needs of young children with ASD. Although there was a goal for interviewing more teachers, only six agreed to participate in the interviews. Despite this limitation, all six teachers shared their views on inclusion, the effectiveness of various EBPs they had used, and their opinions about the necessity of EBPs in general, as well as the support for and barriers to implementation of EBPs in inclusive settings.

A third limitation is that this study did not compare teachers' perceived knowledge and use of EBPs with their actual knowledge and use of EBPs. In the absence of observational data on teachers' actual implementation in the classroom, the study was unable to determine teachers perceived versus actual knowledge and use of EBPs.

## **Conclusion**

This study was designed to understand teachers' perspectives on the use of EBPs to improve the communication skills of young children with ASD in inclusive classrooms, and to understand associations between their perspectives, training, and experiences with implementing EBPs. The findings showed that while there was no relationship between teachers' overall beliefs about EBPs and their years of teaching experience, there was a strong correlation with regard to their beliefs about EBPs when compared to their perceived knowledge and training on the use of EBPs. The majority of teachers agreed that all 13 of the EBPs explored in this study could potentially be effective interventions for improving the communication skills of young children with ASD in inclusive classrooms when appropriate training and supports are in place. A number of factors impacted teachers' ability to implement EBPs. The most frequently reported barriers to effective EBP implementation were resources, class size, and time. The most frequently reported supports provided to ECE teachers were support offered by related services providers, access to technology and instructional coaching. The least frequently provided supports were training opportunities for EBPs and extra time for lesson planning.

Findings of the present study add to the current body of research supporting these 13 practices as effective EBPs that teachers can use to support communication needs of young children with ASD. However, ECE teachers need appropriate training (pre-service and in-service), resources (staffing, equipment, and materials), and time (for planning and implementation) to be able implement EBPs in their classrooms while supporting

learning and development of all children. Overall, the results suggest that the research to practice gap regarding ECE teachers' implementation of EBPs is not due to the ineffectiveness of the EBPs per se, but rather due to teachers' lack of time, resources, and training to implement them.

The findings of the current study also add to the research literature that shows that although ECE teachers generally support inclusive education, they have mixed feelings about including children with ASD who have severe disabilities. Two of the six teachers interviewed in the study spoke at length about the lack of needed supports to attend fully to their learners with extreme needs (one student with severe behavioral outbursts because he could not verbally express his want and needs, and another child who soiled his pants daily because he was nonverbal and couldn't express his need to even go to the bathroom). The lack of support available to teachers may impact their perspective on the importance of including these children in inclusive ECE settings so that they have the same opportunities as typical learners to reach their fullest potential. If teachers do not have the necessary support to learn about and effectively implement EBPs with young children with ASD, they will not experience the successes of these children and will fail to see their benefits. It is critical that appropriate and necessary training and resources are provided to ECE teachers to ensure they are properly equipped to meet the needs of all children in their ECE classrooms.



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## **APPENDIX A**

### **ONLINE SURVEY PROTOCOLS**

#### **Purpose**

This survey is designed to gather information about your perceptions and experiences with using evidence-based practices, educational strategies that are supported by research to be effective, to improve the functional communication skills of young children with autism in inclusion classrooms. Functional communication deficits are speech and language delays that impair one's ability to verbally express his or her basic feelings, wants, and needs. To gather information for this study, we are asking certified early childhood classroom teachers to complete the following survey. Thank you for participating in this project!

#### **Survey Instructions**

Read these instructions carefully before completing the survey. The survey is divided into two main sections: (1) questions requesting demographic information and (2) questions about your personal beliefs, knowledge, training and experience regarding the use of use EBPs for functional communication.

**If you have questions or the directions are unclear, please call or email Khulod Alamer at: [ksalamer@uncg.edu](mailto:ksalamer@uncg.edu).**

- Please provide complete information for each item.
- If an item does not apply to you or your beliefs/experiences or you feel uncomfortable providing the information asked of you, skip the item and move on to the next.
- If you are answering a question with an "other" category option, and your answer does not match any of the given categories, please check the "other" category and provide the information in the space provided. This will help us understand your beliefs/experiences more accurately.



**This section of the survey asks basic demographic information.**

**I. Individual Characteristics**

*For the following items, select the answer items, select the answer that best describes you.*

**A. Gender**

1. Female
2. Male

**B. Race**

1. Caucasian or White
2. Black, African American
3. American Indian or Alaska Native
4. Asian Indian
5. Chinese
6. Filipino
7. Japanese
8. Korean
9. Vietnamese
10. Native Hawaiian
11. Guamanian or Chamorro
12. Samoan
13. Other Asian (e.g., Hmong, Laotian, Thai, Pakistani, Cambodian)
14. Other Pacific Islander (e.g., Fijian, Togan)
15. Other race

**C. Ethnicity**

1. Are you of Hispanic, Latino, or Spanish origin?
  - a) No
  - b) Yes – Hispanic
  - c) Yes – Spanish
  - d) Yes – Latino

**D. How many total years of experience do you have as a licensed teacher, at any grade level? If it is less than 1 year, please enter 00.**

---

- E. How many years have you worked as a licensed teacher in the early childhood classroom? If it is less than 1 year, please enter 00**
- \_\_\_\_\_

- F. Number of preschool age children with autism have you have worked within the preschool inclusion settings during your total years of experience.**

1. 1-5
2. 6-10
3. 11-15
4. 16-20
5. 21 or more

- G. Number of children with autism you are currently working with in current preschool inclusive classroom**

1. 0
2. 1-2
3. 3-4
4. 5 or more

## **II. Personal Beliefs**

*For the following items, select the answer that best describes your beliefs about using EBPs in early childhood classrooms.*

- A. Application of EBPs is necessary when working with preschoolers with autism.**

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

- B. EBPs, in general, are easy to implement in the early childhood classroom.**

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

- C. EBPs help me make decisions about how to best support my student(s) with autism.**

1. Strongly Disagree
2. Disagree

3. Neutral
4. Agree
5. Strongly Agree

**D. I am confident in my ability to critically review professional literature regarding the use of evidence-based practices in the early childhood classroom.**

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

**III. Knowledge, Training and Experience**

*For the following items, select the answer that best describes your knowledge, training, and experience with using EBPs in the early childhood classroom.*

**A. My preservice teacher preparation program sufficiently trained me on a number of EBPs and how to select and implement them effectively in my early childhood classroom.**

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

**B. My center/program provides ongoing professional development training and/or support on selecting and using appropriate EBPs for teaching preschoolers with autism.**

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

**C. My center/program provides the following supports that help me select and implement appropriate EBPs for teaching preschoolers with autism in an inclusive setting. (choose all that apply)**

1. Related services (i.e., nurse, therapist, counselor, specialist, teacher assistant)
  - a. Never
  - b. Rarely

- c. Sometimes
- d. Often
- e. Always

2. Instructional coach support

- a. Never
- b. Rarely
- c. Sometimes
- d. Often
- e. Always

3. Extra time for lesson planning

- a. Never
- b. Rarely
- c. Sometimes
- d. Often
- e. Always

4. EBP training opportunities

- a. Never
- b. Rarely
- c. Sometimes
- d. Often
- e. Always

5. EBP resources and materials

- a. Never
- b. Rarely
- c. Sometimes
- d. Often
- e. Always

6. Access to technology

- a. Never
- b. Rarely
- c. Sometimes
- d. Often
- e. Always

**D. Over the past school year, I have read/reviewed \_\_\_\_\_ research articles related to using EBPs to teach preschoolers with autism.**

- 1. 0 to 1
- 2. 2 to 5
- 3. 6 to 10

4. 11 to 15
5. 16 or more

**E. Keeping up with literature and research findings to learn about specific EBPs for teaching young children with autism is a regular part of my practice as an early childhood teacher.**

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly

**F. I actively seek out training and professional development opportunities to be able to select or learn about EBPs that may be applicable to my students' needs.**

1. Never
2. Rarely
3. Sometimes
4. Often
5. Always

**G. I have used online resources (e.g, AFIRM, AIM) for support with selecting and using EBPs.**

1. Never
2. Rarely
3. Sometimes
4. Often
5. Always

**IV. EBPS for functional communication**

*Check all that apply to explain your past experience(s) with implementing each EBP.*

**A. Discrete trial teaching (DTT):**

Instructional process usually involving one teacher/service provider and one student/client and designed to teach appropriate behavior or skills.

Instruction usually involves massed trials. Each trial consists of the teacher's instruction/presentation, the child's response, a carefully planned consequence, and a pause prior to presenting the next instruction.

**1. Knowledge:**

- a) never heard of
- b) some knowledge

- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral
  - (4) agree
  - (5) strongly Agree

**3. Barriers:**

- a) large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice

- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**B. Exercise (ECE):** Increase in physical exertion as a means of reducing problem behaviors or increasing appropriate behavior.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral
  - (4) agree
  - (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it

- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**C. Social skills (SS)** Group or individual instruction designed to teach learners with autism spectrum disorders (ASD) ways to appropriately interact with peers, adults, and other individuals. Most social skill meetings include instruction on basic concepts, role-playing or practice, and feedback to help learners with ASD acquire and practice communication, play, or social skills to promote positive interactions with peers.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.



- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral
  - (4) agree
  - (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**D. Modeling (MD)** Demonstration of a desired target behavior that results in imitation of the behavior by the learner and that leads to the acquisition of the imitated behavior. This EBP is often combined with other strategies such as prompting and reinforcement.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:

- (1) ineffective
- (2) somewhat effective
- (3) very effective.

c) Have implemented this EBP exactly as directed, and overall, the intervention was:

- (1) ineffective
- (2) somewhat effective
- (3) very effective.

d) I foresee using this intervention again in the future when targeting students' communication needs

- (1) strongly Disagree
- (2) disagree
- (3) neutral
- (4) agree
- (5) strongly Agree

### 3. **Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**E. Naturalistic intervention (NI)** Intervention strategies that occur within the typical setting/activities/routines in which the learner participates. Teachers/service providers establish the learner's interest in a learning event through arrangement of the setting/activity/routine, provide necessary support for the learner to engage in the targeted behavior, elaborate on the behavior when it occurs, and/or arrange natural consequences for the targeted behavior or skills.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral
  - (4) agree
  - (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP

- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**F. Peer-mediated instruction (PMI)** Typically developing peers interact with and/or help children and youth with ASD to acquire new behavior, communication, and social skills by increasing social and learn opportunities within natural environments. Teachers/service providers systematically teach peers strategies for engaging children and youth with ASD in positive and extended social interactions in both teacher-directed and learner-initiated activities.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree

- (3) neutral
- (4) agree
- (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc. to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**H. Pivotal response training (PRT):** Pivotal learning variables (i.e., motivation, responding to multiple cues, self-management, and self-initiations) guide intervention practices that are implemented in settings that build on learner interests and initiative.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.

- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral
  - (4) agree
  - (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**I. Prompting (PP)** Verbal, gestural, or physical assistance given to learners to assist them in acquiring or engaging in a targeted behavior or skill. Prompts are generally given by an adult or peer before or as a learner attempts to use a skill.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral
  - (4) agree
  - (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**J. Reinforcement (R+)** An event, activity, or other circumstance occurring after a learner engages in a desired behavior that leads to the increased occurrence of the behavior in the future.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.

- (1) No (no more options will appear)
- (2) Yes

- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:

- (1) ineffective
- (2) somewhat effective
- (3) very effective.

- c) Have implemented this EBP exactly as directed, and overall, the intervention was:

- (1) ineffective
- (2) somewhat effective
- (3) very effective.

- d) I foresee using this intervention again in the future when targeting students' communication needs

- (1) strongly Disagree
- (2) disagree
- (3) neutral
- (4) agree
- (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP



- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBP effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**K. Video modeling (VM)** A visual model of the targeted behavior or skill (typically, in the behavior, communication, play, or social domains), provided via video recording and display equipment to assist learning in or engaging a desired behavior or skill.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral

- (4) agree
- (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBP effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**L. Differential reinforcement (DR)** Provision of positive/desirable consequences for behaviors or their absence that reduce the occurrence of an undesirable behavior. Reinforcement provided: a) when the learner is engaging in a specific desired behavior

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.
  - (1) No (no more options will appear)
  - (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.

- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral
  - (4) agree
  - (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBP effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**M. Functional communication training (FCT)** Replacement of interfering behavior that has a communication function with more appropriate communication that accomplishes the same function.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.

- (1) No (no more options will appear)
- (2) Yes
- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- c) Have implemented this EBP exactly as directed, and overall, the intervention was:
  - (1) ineffective
  - (2) somewhat effective
  - (3) very effective.
- d) I foresee using this intervention again in the future when targeting students' communication needs
  - (1) strongly Disagree
  - (2) disagree
  - (3) neutral
  - (4) agree
  - (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP
- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**N. Picture Exchange Communication System (PECS):** Learners are initially taught to give a picture of a desired item to a communicative partner in exchange for the desired item. PECS consists of six phases

which are: (1) “how” to communicate, (2) distance and persistence, (3) picture discrimination, (4) sentence structure, (5) responsive requesting, and (6) commenting.

**1. Knowledge:**

- a) never heard of
- b) some knowledge
- c) adequate knowledge
- d) extensive knowledge

**2. Implementation:**

- a) I have attempted this intervention while working with one or more students with autism to target communication skills.

- (1) No (no more options will appear)
- (2) Yes

- b) I have implemented this EBP with one or more adaptations, and overall, the intervention was:

- (1) ineffective
- (2) somewhat effective
- (3) very effective

- c) Have implemented this EBP exactly as directed, and overall, the intervention was:

- (1) ineffective
- (2) somewhat effective
- (3) very effective

- d) I foresee using this intervention again in the future when targeting students’ communication needs

- (1) strongly Disagree
- (2) disagree
- (3) neutral
- (4) agree
- (5) strongly Agree

**3. Barriers:**

- a) Large class size
- b) Insufficient time to meet and plan with others, develop, and/or implement it
- c) Lack of resources (staff, materials, administrative support, etc.) to implement it
- d) Lack of sufficient teacher preparation/pre-service training on this EBP

- e) Lack of ongoing school/center professional development on this EBP
- f) Lack of confidence in my ability to implement this EBPs effectively
- g) Lack of belief/trust in the EBP research findings that this is a best practice
- h) Not applicable to the specific needs of any of my students with autism
- i) Other (please specify): \_\_\_\_\_

**Please If you would be interested in participating in 60 minutes an interview to further discuss your experiences and perceptions and receive a \$20 Target or Walmart gift card for participation.**

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**Thank you for participating in this survey.**

## APPENDIX B

### THE INTERVIEW QUESTIONS PROTOCOL

#### The Interview Questions

*Please reflect on your personal experiences, thoughts, and opinions to answer questions.*

#### **Experience:**

1. Please explain your philosophy on the inclusion of children with autism in mainstream early childhood classrooms. What are the benefits and challenges?
2. Describe the characteristics that stand out the most to you with regard to the needs of the preschooler(s) with autism that you have worked with in your inclusion classroom.
3. Statistics show that about 30% of children with autism enter preschool with very limited communication skills. Describe the functional communication limitations, if any, that you have experienced with the preschooler(s) with autism you have worked with.

#### **About evidence-based practices:**

4. What intervention(s) do you typically use to help a child who is having difficulty expressing his or her wants or needs?
5. What process do you use to determine what interventions to use in your classroom?
6. Which of these 13 evidence based practice(s), if any, would you say is the most effective for improving the functional communication skills of preschoolers with autism, and why?
7. Is there a particular EBP that you feel is not at all practical for use in the EC inclusion classroom, and why?

#### **Benefits and challenges:**

8. Why do you think you have had success with this evidence-based practice? (Probe interviewee to consider his/her knowledge and experience, the specific needs of the students, practicality of implementation in the inclusion setting, classroom dynamics, staff support and resources, administrative or program directives, etc.)
9. There were 13 evidence based practices listed in the online survey that have been found to be effective for improving the functional communication needs of young children with autism in preschool classroom settings. What is your experience with using any of these evidence-based practices to meet the needs of the students with autism in your classroom? For example, did you experience any particular challenges and successes with certain EBPs?
10. What type of support has been the most helpful for you with regard to learning how to select and effectively implement EBPs? (Probe interviewee to consider pre-service coursework and training, online modules, in-service workshops,

collaborating with other teachers who have EBP experience, in-class instructional coaching and feedback, etc.)